AMERICAN JOURNAL *of* PHARMACY

SINCE 1825

A Record of the Progress of Pharmacy and the Allied Sciences

Vol. 105 APRIL, 1933 No. 4

CONTENTS

Price $3.00 per Annum in Advance Foreign Postage, 25 Cents Extra

Single Numbers, 30 Cents. Back Numbers, 50 Cents

Entered as Second-Class Matter at the Post Office at Philadelphia, Pa., Under the Act of March 3, 1879

Acceptance for Mailing at Special Rate of Postage Provided for in Section 1103, Act of October 3, 1917. Authorized February 15, 1920

PUBLISHED MONTHLY BY THE

Philadelphia College of Pharmacy and Science

43d Street and Kingsessing Avenue, West Philadelphia, Pa.

American Journal of Pharmacy

ESTABLISHED IN 1825

Four preliminary numbers were published at different times until in 1829, when the publication of the regular volumes began. Since then the publication has been uninterrupted. During the period from 1829 to 1852 four numbers were published annually, except in 1847, when five numbers were published. From 1853 to 1870 six numbers were published. Since this time twelve numbers have been published annually.

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THE AMERICAN
JOURNAL OF PHARMACY

VOL. 105 APRIL, 1933 NO. 4

EDITORIAL

CONTROL OF THE TRAFFIC IN AND THE LABELING OF AMPULS AND MEDICAMENTS FOR PARENTERAL ADMINISTRATION

IN JUNE, 1931, the writer presented a paper before the Pennsylvania Pharmaceutical Association at its annual convention (which was published in their proceedings and in this JOURNAL, Vol. 103, September, 1931), calling the attention of the pharmacist to the importance of not neglecting the field of ampuls and intravenous solutions. At the same time the attention of various pharmaceutical associations was directed to the advisability of conferring with local or state health departments so as to have the stores of their members serve as depots for the distribution of free biologicals. No action seems to have been taken along these lines and little or no progress is therefore to be reported. Pharmacists display a laxity in taking advantage of their scientific training and in combining this with their aggressive and skillful merchandising ability for the benefit of professional pharmacy.

Within the past few months a more serious aspect of the sale of ampuls and intravenous solutions has been brought to our attention. A report of a local physician that a suppurative condition had developed after the injection of the contents of an ampul resulted in an investigation. This disclosed that a similar condition had developed in at least one other patient from the same batch of ampuls even though in both instances modern aseptic precautionary measures were practiced. Two (2) ampuls from this batch were examined and each revealed the presence of a pure culture of a pathogenic staphylococcus aureus. The product was one shipped in interstate commerce and therefore was under the control of the Food and Drug Administration at Washington. In a brief survey it was astonishing to learn

that there are no records or reports which have been published revealing the examination and the sterility of such marketable preparations. We have also been led to understand that the Food and Drug Administration has never collected these products on the market or made any concerted effort to examine such preparations. More than likely the State departments of health have also neglected to guard the control of these products.

It is undoubtedly apparent to any one that a close supervision of such a class of preparations as mentioned herein is of the utmost importance. It is undoubtedly of greater import than many of the other phases of food and drug control as practiced today. It behooves the Food and Drug Administration at Washington and State authorities to make a close investigation of this entire problem to be followed by the necessary steps to guard the control of the interstate and intrastate traffic in these preparations. The following ideas are submitted as being of value in this connection.

1. *How should such preparations be labeled?* There is no doubt but that the practitioner assumes that any preparation dispensed in an ampul or vial or container for parenteral administration is sterile. But unless the word "sterile" is actually found on the label as "sterile ampuls of sodium cacodylate" or a statement "this solution is sterile" is present on the label or container, it is questionable whether one has any redress in the courts of law, if a preparation not labeled as to the sterilty is found to be contaminated and the cause of an infection. The only exception would be in the case of preparations official in the U. S. P. or N. F. and providing the latter mention the fact that the finished product must be sterile. It is therefore important for the National Formulary Revision Committee to add the word "sterile" to the official title or in the description of the specific ampuls to be admitted or the statement might be added that "this is a sterile solution." The U. S. P. Revision Committee must do the same for preparations intended for parenteral administration. With such notations the users of these preparations will be protected.

2. It must be remembered that only few formulas for ampuls or intravenous solutions will be admitted in the new edition of the U. S. P. and the National Formulary. The vast majority of such preparations will have no standard by which to be governed. It is therefore very important that the Food and Drug Administration give this matter immediate consideration and adopt such measures

as may seem best to protect the public and honest as well as careful manufacturers, remembering that such solutions for parenteral administration are generally regarded as STERILE preparations intended or represented directly or indirectly to be useful for the cure, mitigation or prevention of disease. I made a brief survey of the ampuls found on the American market at present. It was found that many of the leading pharmaceutical houses in this country assured the consumer of the sterility of their products in the use of such phrases on their labels as "sterile solutions of, etc."; "carefully and completely sterilized"; or other notations giving assurances of a thorough sterilization. On the other hand there are some of the well-known manufacturers and many smaller houses who say nothing about the sterility of the contents of the ampuls. It was also found that many well-known "trade-marked" preparations and proprietaries (not biological products) marketed in ampuls or containers for parenteral administration do not mention anything concerning the sterility of the product. A survey of similar foreign preparations especially from Germany, France, Italy and Switzerland revealed that the Ciba ampuls are labeled as "sterile solutions," while most all others including the Fraisse, Kahlbaum and Zambeletti ampuls do not in all instances mention the sterility of the contents of such preparations intended for parenteral administration.

The National Institute of Health guards the control in the traffic of biological preparations (employed also for parenteral administration) by compelling the manufacturers of the latter to obtain a license. This enables the department to observe the sanitary control employed in the marketing of these preparations and to guard the sterility as well as the potency of the finished product. There are, of course, many objections for the introduction of such a system for simple medicaments. In like manner there may be an objection to take the control of simple medicaments out of the hands of the Food and Drug Administration and the Department of Agriculture and turn this over to the Secretary of the Treasury and the National Institute of Health. But something must be done even if it may be found necessary to introduce an immediate amendment to the Pure Food and Drug Act, so as to more carefully control and guard this class of preparations. Until such time, however, manufacturers should label their ampuls and preparations for parenteral administration as "sterile" if this is actually the case. Where a large supply of labels are already in stock this word can be added merely with a rubber stamp.

3. It has also been observed that to many of these solutions a preservative has been added, although no statement is found on the label revealing the fact that a preservative is present, nor is the name of the preservative given. In instances where phenol or phenolic bodies were added as preservatives, cases are recorded where local irritations, specially in children, resulted from the use of preparations containing these chemicals.

It is apparent that it is of great importance that these preparations should be labeled properly and that a more careful control of regulating the proper labeling of as well as the traffic in these marketable ready-made intravenous and hypodermatic solutions should be practiced.

LOUIS GERSHENFELD.

NICOTINE—At a recent inquest on a woman who died from nicotine poisoning some outspoken comments on the ease with which supplies of this most toxic substance can be obtained were made by the coroner. There were also, apparently, some misstatements as to the regulation existing in connection with its supply. According to the newspaper report, the coroner was informed by the detective inspector that preparations of nicotine, for use as insecticides, could not be obtained through persons other than chemists. The coroner was also told that restrictions were placed on its sale by the Home Office, and that it was necessary for the chemist to record every sale of nicotine. His inquiries had shown that the deadly character of nicotine insecticide was not generally known among the public. I would suggest that the police officer should have known that not only chemists, but licensed dealers in agricultural and horticultural poisons are permitted to supply nicotine insecticides. Whereas the chemist would be properly informed regarding the highly toxic nature of the preparation, the licensed seedsman or ironmonger could not be expected to have this knowledge or to be in a position to advise his customer. The coroner contended that these nicotine preparations should not be available in so highly concentrated a form, and that the matter was of sufficient importance for him to communicate with the Government department concerned. This case is surely an additional argument in favour of restricting, rather than extending, the list of distributors of the more toxic horticultural poisons.—(*Phar. Jour.*, Feb. 11, 1933, p. 114.)

ORIGINAL ARTICLES

SILVER THREADS AMONG THE GOLD*
BEING THE STORY OF HUMAN HAIR

By Ivor Griffith, P. D., Ph. M.

Associate Professor of Pharmacy, Editor American Journal of Pharmacy

MAN is the only existing animal capable of self-dress—and even that distinction is of but recent acquisition.

If we dare think with Darwin and do a bit of dreaming too—how easy it is to draw a mental picture of the grand-daddy of all of us, perched on a tree top—bare but for hair and with giggles and grunts his only means of expression. When darkness came he furtively slid to earth—and found his food afield—berries and bulbs and tubers. Rarely he tasted the swill of the kill.

Ivor Griffith

Of clothes he had none—needed none, save the natural coat of wiry hair that covered all his person. Tonsorially and sartorially nature took care of his every want.

When glacial winds whistled through the tree tops, crisping the conifer tips, his shaggy overwhelming hair, grimy with gum and grease, kept him in bloodwarm comfort. And when birds awing gurgled again with the ecstacy of spring returning—when antediluvian crocuses and prehistoric lilacs rehearsed their spring performances for poets yet unborn—our hairy ancestral brute, his winter garment of abundance flung—moulted as it were—and in his flimsier summer fur filled the forest with his frantic antics.

TREE-TOP LIFE

But tree-top life was a hazardous life—only the fit surviving. However sometime, somehow, it came to pass that the fuzzy creature deserted the tree tops and sought the sheltered safety of the stone-bound cave.

To him, came then, from the same strange somewhere, the germ of conscious thought. Instinct had been his before—in common with

*One of a Series of Popular Science Lectures given at the Philadelphia College of Pharmacy & Science, 1933 Season.

his animal kind—but when the gift of reason came the little mammal of the cave—so changed his status and his stature that all of earth was soon his property. No cave was big enough to contain him, and dinosaur and wooly rhinocerous faded from the picture. Mammoth and mastodon returned to their mud—for man—the walking, stalking, thinking beast had at last reached the open. The hills of chaos were behind and the everlasting plains ahead. The dumb denizen of the cave stood upright in the image of his guide and God—and fear had gone from his heart.

Two clumsy forelegs changed to nimble arms and hands—and in their new deftness stone and flint were turned to tools and weapons. No longer transfixed to his cave—and secure in his new found friends of rock and thong, he ventured far afield and sought and fought his kith and kin—a brutal, relentless killer.

Their blood he drank—their flesh he devoured—their skins he stole for winter coverings. And as the short millenia dusted down the stairs of time—the chances and changes of field and fare slowly but surely sent him on his separate way—no longer a silly simian, but lord and master of all he surveyed—no longer the acquisitive, appropriative animal—binder only of space—but an adaptive, creative character—a marker of time and a maker of tomorrows.

And with his striking change in habits came too, a change in his looks—and in his views. The clothes he wore in tree-top days no longer chose to stay with him. Little by little he shed his mangy coat—and, except in isolated spots, his anatomic landscape had lost its vegetation.

ANTEDILUVIAN BALDNESS

Just how such wholesale shedding occurred can never be explained with satisfaction, although this spotty alopecia is guessed by the evolutionist to have come about through those changes in diet and habits which came to man when first he acquired reason.

Professor Fleecy, of Oxford, England, whose very name befits a hair expert, told a recent assembly of the British Association for the Advancement of Science that

"The human race lost its hair because in antediluvian times the enormous hair growth on their bodies was an impediment which they removed by singeing it with glowing embers from their camp fires. This singeing," continues the professor, "destroyed the body hair and gave increased speed to the cave man hunter and his whining mate."

In automotive language the professor might have said that the craze of the day was for streamline design—less hair—more flair—less nap—more snap—and get away.

Yet how strangely do some professors err! For thousands of years our sheep have been sheared of their wool wherewith to clothe the human race, and still we go wool-gathering and still the sheep produces.

But to return from our muttons—it took our hero but a little time to turn the trick of winter, warming his flesh by stealing and wearing overcoats from his defunct and departed animal friends.

But we do not have to accept the word of the evolutionist for man's ancient predilection towards the clothes of his animal kin. For in the oldest and finest history book of all time—the Bible—we find an early reference to this purloining of clothes from the dead.

BARELY CONSCIOUS

When Eve had eaten Adam out of house and home, and so made the apple a symbol of lasting employment, new concepts of dress resulted. Outside the garden wall—the mother of men turned tailor and seamstress too. For the primal sin had made the pair conscious of new sensations—not the least significant of which was that Eden Suburbs were no place for a nudist colony.

Title page from Heures a l'usage de Rome (Philippe Pigouchet), Paris, 1496—showing the ancient artist's conception of early man and woman in their primitive coats of fur.

Adam, breathless, scurried over garden wall and plucked a leafy fig branch. Whereupon Eve, with a stitching versatility and skill no longer expected of her daughters, "sewed fig leaves together and made themselves aprons." Such was the first adventure in custom tailoring.

Yet so perishable was this primitive one-piece suit—and so scant in warmth and comfort, that when winter came to Eden Suburbs, and the whinnying winds of Jordan drove the shivering sinners to some sunless sul-

terranean cave, the compassion of Him "whose mercy is over all His works" is thus recorded in early Genesis—"Unto Adam also and to his wife did the Lord God make coats of skins and clothed them."

So did Adam and Eve discard their vegetarian outfit and turn to animal hair for comfort. And what a joy it must have been to Eve, and a greater joy for Adam, to know that on the primal promenade Eve had no competitor. Her fur coat—no other style, or fit, or fashion could possibly transcend hers—for she had the first and only choice of outfits.

But one wonders, after all, whether this loss of hair—the hair that once covered man's body but left him, left him also with some deep and sore regrets. One wonders what efforts—primitive perhaps—but hardly else than heroic too—what efforts were made to keep it from shedding.

THE FIRST HAIR TONIC!

Here was the germ perhaps, whence started that gargantuan hair-tonic industry, that has continued even unto these technocratic times—here perhaps was the headspring whence emanate the hopes—the tragic hopes—that have heartened, for the nonce at least, countless hapless, napless generations of hair tonic habitues and dandruff disdainers.

When Husband John, in his early forties, morning clad in linen uglies, stands before his mercurial shadow—stands in a semi-stupor—his pop-eyed stare fixed on a measly dandruff-deadened tuft of hair that twines around the same old comb—fallen from his noble dome like shingles from an old neglected roof—is it a million year old urge that makes him look and look again at his moth-eaten pompadour and sigh and sigh and sigh?

And is it a million-year-old vestigial hope that compels him to stop the very same day at the shop of the colored globes—to buy from a bald-headed wretch with a giggling eye—a bottle of somebody's hair coaxer?

Even perhaps as the primitive head of the house hid from his chattering mate a wad of foul-smelling bear grease, hid it in a murky corner of the cave, so too does Husband John tote home his sprinkling container of perfumed hope, and hides it with the other perfumes in his sacred cellarette.

And were it the disposition of the lecturer to confine his remarks this evening to the subject of Husband John's hopes for a restoration of his cranial upholstery—and to the sundry and devious devices fos-

tered by men of all ages and climes, and vainly dedicated to a realization of Husband John's aims and hopes—of these things alone there would be more than sufficient material wherewith to fill our evening.

But we must hie to our specific subject—and with academic glee, anchor our craft in charted waters. Certainly—our introduction must have developed the fact that this lecture is meant eventually to discuss hair—human hair—what is left of it—and geographically—only that of it which has the dubious duty of protecting that department of the human economy where the brain, if any, rests in its bony repository.

THE FUNCTIONS OF HAIR

But just what is hair and what are its functions? Physically it is simply an extension of skin substance pushed out of the flesh, and having for its major purpose that of protecting the skin surface against cold. Of course, it is admissible that this is no more of a real definition than it would be to define a tree as an extension of the face of the globe. And the same ambiguous definition might be applied to the Empire State Building, calling it an extension of the earth's crust, to say nothing of the extension of credit that it has involved.

It can hardly be, however, that the only function of hair is to protect against the cold, unless it be that its esthetic qualities are merely incidental. Subtly, perhaps, it operates in nature's scheme of sex attraction and distraction, exactly as fine feathers—making fine birds—cause the homely brown hen to place her total trust in a proud and hopelessly polygamic husband.

THESE EXOTIC THINGS!

After all, poets know more than professors about these exotic genetic things—and hearken then, to these small, scant verses that tell a volume of the league of hair and love in a volatile line or two.

To the ladies:

> "Fair tresses man's imperial race ensnare
> And beauty draws us with a single hair."
> Pope: *Rape of the Lock*—Canto II—line 27.

> "Love in these labyrinths his slaves detains
> And mighty hearts are held in slender chains."
> Canto II—line 27.

> "She knows her man, and when you rant and swear
> Can draw you to her with a single hair."
> Dryden: *Persius*—Sat. V—line 296.

And to the bearded gentlemen:

> "His tawny beard was the equal grace
> Both of his wisdom and his face."

And now that we have mentioned that much maligned though eminently male monopoly—whiskers—let it be noted that since the speaker sex has latterly affected so many manisms—from the wrinkled fedora to the pressed pants—to say nothing of the bobbed hair, and the right to vote and to smoke cigarettes—outside of a cigar perched on his lips, the only belonging symbol of masculinity left for mere man to cultivate is—whiskers. Whether fire regulations and hazards will permit both the cigar and the whiskers remains a doubt.

But the lecturer ventures the prediction—all other opinions to the contrary notwithstanding—that another decade will see the return of the beard from brave goatee to burnsides, to the fulsomeness of their halycon days—when man will again affect to a facial disport and dignity that only the bearded lady of the circus can ever hope to even unworthily emulate. And pity then that barren-chinned male, of whom Shakespeare sang: "Alas, poor chin, many a wart is richer."

The only deterrent to a return of the typical vigor and enterprise of the spinach and soup-strainer fad to this land, will be American business men, the shirt, collar and tie manufacturers who may try psychologic, propagandic means to avoid it.

WHISKERS! Mussolini, however, in a press interview recently, declared himself against whiskers. "Fascism," said he, "is definitely anti-whiskers—Caesar—Augustus and other great Romans were all clean shavers." Modesty, of course, forbade that he mention the greatest Roman and romancer of them all—Mussolini—and he continued, "the beard belongs to the redolent Orient—the smooth face to the busy Occident—whiskers are a sign of decadence." Had Mussolini remembered his history a bit better he would have recalled that it was the mop-headed, wiry-haired hordes from the north who finally swept clean-shaven Rome from her home on the Tiberian hills. And Gibbons might have easily summarized his ponderous work and his reasons for the Decline and Fall of the Roman Empire into this one lone word—Whiskers!

To return to the functions of hair. The ancients, according to Galen, believed that hair acted as a flue to carry off noxious vapors from the head, and perhaps though they guessed at it, the ancients were right. And their hypothesis may explain why we seldom see soap-box orators, paregoric poets and jazz-band pilots without a luxuriance of lubricated scalp growth.

Nor must we ever believe that Nature always preserves her ratios. Thus it must never be argued that bigger and better brains call for additional protection, and that an abundance of hair bespeaks an abundance of brains. Indeed the old proverb insists on saying

"Long hair—short wit."

And another that

"If the beard were all the goat would preach."

A silly tradition has it that all musicians have long hair—and that practicing on a piccolo is conducive to long hair. Again nonsense:

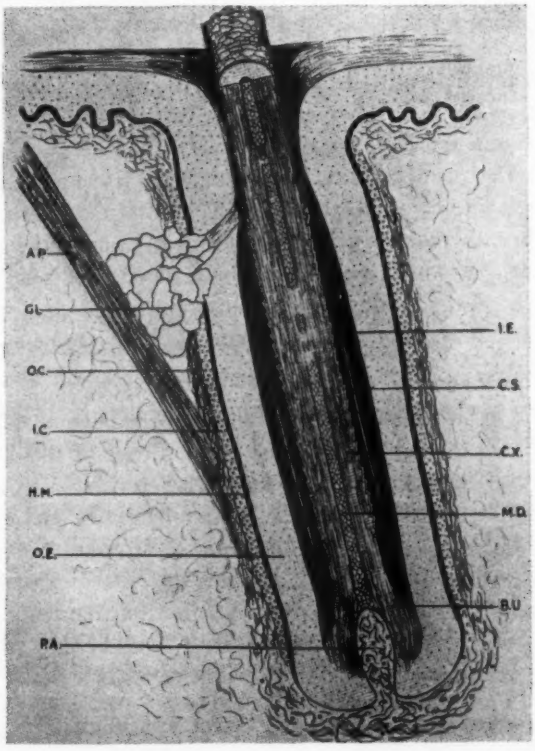

Fig. 2—Diagram of a hair in its follicle.

A.P. arrector pili muscle; G.L. sebaceous gland; O.C. longitudinal fibers of connective tissue sheath; I.C. circular fibers of connective tissue sheath; H.M. hyaline membrane; O.E. outer epithelial sheath; P.A. hair papilla; I.E. inner epithelial sheath; C.S. cuticular scale of hair shaft; C.X. cortex of hair shaft; M.D. medulla of hair shaft; B.U. the bulb.—(From The Hair—O'Donovan, Churchill & Son, London.)

Indeed practicing on a piccolo is conducive, not to long hair—but to a short life—at least if the neighbors have anything to say about it.

And now that we have considered the functions of hair, let us consider its structure and some of its properties.

HAIR GROWTH

Each individual fiber of hair usually arises from a bulb-shaped depression in the epidermal tissue, growth occurring in much the same fashion that shaving cream or toothpaste is extruded from a collapsible tube, except of course that fiber growth is a slow cell-multiplying process. A keratinizing or hardening occurs as the hair shaft reaches the skin level, and growth thereafter seems impelled by additions to the base from the multiplication of cells of the papilla. The collapsible tube analogy may be continued here, for while the paste within the tube remains plastic, the extruded paste, if permitted to remain in the air, hardens and shrinks a little, just as the hair fiber hardens. Within the fiber itself, contrary to common opinion, there is no real life, for no blood or nerve supply is carried up the shaft. If there were life in the hair fiber—life in the physiologic sense, the kind of life that nerve and blood produce—a trip to the barber's chair would mean much more than it now does. The barber's pole with its stripe of bloody red would return to its original surgical significance, every haircut would be a major operation, ether would replace lilac, and shampoo soap give way to Dakin's or Salt Solution.

OVERNIGHT FRIGHT BLANCHING

No blood or nerve supply goes beyond the papilla, or the very root of the hair. Proof of this is in the fact that pain is experienced when a hair is pulled out by the roots, whereas it may be cut or shaved off without the slightest nerve shock. This seems to discount the oft-repeated tale of hair through shock of fright, turning to white just overnight. Physiologically this appears impossible, for the pigments of the hair once pushed up the hair shaft are detached from blood and nerve supply, and are therefore unaffectable by any nervous shock.

Do you recall from Byron's Prisoner of Chillon:

"My hair is gray, but not with years,
Nor grew it white
In a single night,
As men's have grown from sudden fears."

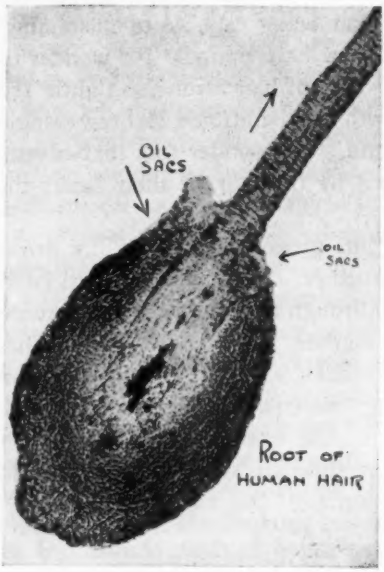

Fig. 3—Root-Magnification about 100x.

As a matter of fact many of the romantic hairy tales of history such as the story of Marie Antoinette—whose gorgeous crown of hair was alleged to have become white with fright the night before her execution—are prevarications of the first order. Marie had been white for years before, but her hairdressers had been artful and careful enough to hide it. And on the day of her scaffolding she had neither the faculty nor the facilities wherewith to continue the illusion.

The hair fiber is composed of four structural parts, namely: the *medulla* or pith, which is the central column, the *cortex,* which surrounds the pith and corresponds to the wood of the tree, the *pigment granules* and bubbles upon which depend the color of the hair and which are scattered throughout the cortex and frequently within the pith, and finally the cuticle, composing the surface of the fiber, very much as scales cover the exterior of a fish. Sebaceous glands adjacent to the fiber pour a greasy substance, the sebum into the hair follicle or onto the skin. This serves to soften and lubricate the parts. Sweat glands are also in evidence.

The physical properties of the hair fiber are quite diversified. It is quite elastic and can be stretched out from one-fifth to one-third its normal length, although when the tension is removed it will retract to nearly its original length.

Hair is hygroscopic, capable of holding nearly 10 per cent. its weight of water, and it can fairly well keep in equilibrium with the atmosphere. Thus depending upon the amount of moisture in the *air*—depending upon whether the weather is dry or damp, straight hair will often accept a curliness or curly hair straighten somewhat with the vagaries of humidity. This property of hair explains the use of hair fibers in barometers and hygrometers.

STRONG HAIR

Hair has a high tensile strength, a strong hair from a strong man's head being capable of sustaining a dead weight of from a quarter to a half pound. No wonder that Absalom with his 200 shekels (112 oz.) of hair swung so tightly from that fatal tree in whose lower growth this handsome Hebrew dangled, entangled, and met his untimely end. No wonder too, that cavemen are always pictured dragging home by the hair of their heads their crying cooks-to-be.

Hair is electrically negative, this property being readily demonstrable, particularly in dry, cold weather. Thus when a hard rubber comb is passed a number of times through the long hair of a musician a crackling melody will be quite audible. So, too, will a dry hand stroking dry hair, often show in the dark, streaks of magnetic sparks. Thus the common allusion to having "electricity in the hair" is founded on fact—and the wag's comment of the exercise of a public utility monopoly by one having gas on the stomach, water on the brain and electricity in the hair—is no mean pun.

PAGE MEHITABEL!

These fibers are arranged in their cranial bed at a definitely obtuse angle to the skin, and grow from a number of well-defined centers. The obtuseness of the hair angle is so marked indeed, that any attempt to acute it is quite objectionable and referred to as "rubbing the fur the wrong way." Page Mehitabel!!

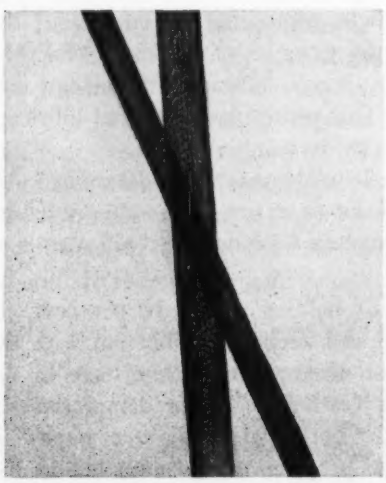

Fig. 4—Two blonde hair fibers from same head. Magnification about 100x.—(H. P. R.)

Sometimes the flow of growth is congenitally disturbed and there is produced the birthmark, the cowlick or the whorl—and sometimes twin whorls, which so often offend the meticulous hairdresser by making the hair unruly and difficult to arrange.

"Causing the hair to stand on end" is not a figure of speech, but an actual physiologic mechanism. "Bristling with anger" is a remark supposedly confined to canine terminology—and one need not believe that Fido is the only creature whose back hair actu-

ally rises when he gets peeved. A highly specialized muscular organization can do precisely the same thing on the scalps of certain humans, when roused to anger—the same muscular mechanism, by the way, which accounts for goose flesh (cutis anserina) in all of us.

Perpendicular hair or hair growing at right angles to the skin, such for instance as eyelid hair, is not supplied with erector muscles and therefore cannot be wagged and wiggled at the will of muscles. Only when the obtuse angle exists does nature need the muscle to help retain the angle.

The hair-sustaining muscle acts very much like an old-fashioned pursestring acts on a leather purse—and a weakening of this muscle through overmuch ease or disease permits the follicle to relax and expurge the fiber from its records. The ability of some people to wrinkle or move the scalp is due to the presence of an unusual proportion of striped muscle in the scalp. This type of muscle, may through exercise develop a permanent perpendicularity in hair—much like that exhibited by von Hindenburg and some of his militant compatriots.

The dimensions of human scalp hair vary considerably with the individual, with age, with race and with location on the scalp. Thus we may find fibers ranging all the way from 1/5th to 1/300th of an inch on one and the same head. The transverse shape too, varies from the rarely round to the commonly oval or kidney-shaped fiber. The flatter the fiber the greater the ease with which it curves and curls.

HAIR NUMEROLOGY

The number of hairs on the healthy scalp vary with age and oddly enough with the color of the hair; 100,000 to 200,000 seems to be a fair range. According to one compiler of such statistics a flaxen-haired beauty disports the greatest number, from 140,000 to 180,000; the black-haired belle a few less 100,000 to 120,000, and the coarser haired red heads even less than 50,000 per head.

The scalp area of normal adults varies from about 100 to 140 square inches, and will produce in the Scriptural tenure of earthly office, namely, three score years and ten, about 240 ounces (15 pounds) of hair, which uncut, unscissored and unsinged, might, have reached a length of nearly 35 feet. On a graded basis these scalp statistics show that a square inch of cranial coverage will annually produce a crop of hair amounting to somewhere between 1/100th to 4/100ths of an ounce.

Variations from these figures occur in the sexes racially as well. Jews and North Americans are more prolific than most peoples.

The length of hair also varies with factors of age, sex, hair character and idiosyncracies. The life cycle of the strand of hair is anywhere from two to six years, that of the eyelash less than six months. Hair grows faster by day than by night—and in summer rather than in winter. Frequent cutting of the hair, or cutting a baby's hair, does not diminish strength, as so many persons think. Sheer nonsense!! The prize fighter who still cuts his hair does so because it makes him look the part and in deference to an old custom from the days when ring gladiators could exercise a hair-pulling technic if they were so disposed. Bill Sykes, the convict, has his hair cut to inhibit the development of insects.

Hair grows all through life from the first to the second childhood and does not stop growing even after death. This is a fact that has been much disputed. A tree, cut down, in the full vigor of its April sap flow, will go on producing leaves for weeks, although its actual root-tied life is ended.

HAIR PERSISTENCE

So, too, will a vigorous body, cut down in the days of its youth and health, continue even in the grave to show a meager growth of living hair. One finds it difficult to believe, however, such a recital as this, which we found in Hawthorne's English Note Book (Vol. 1, p. 96). "The grandmother of Mrs. H. died 50 years ago at the age of 28. She had a head of beautiful chestnut hair. When the tomb was opened a half century later, her coffin was found to be filled with beautiful glossy ringlets, into which her whole substance seems to have been transferred, for there was nothing but these shiny curls left in her tomb."

One authority on this subject claims that post-mortem hair growth is in direct ratio to the amount of reserve hair constituents in the hair follicles at time of death. But then, not even Husband John is interested in determining such post-mortem facts as these. The only people who might have any such interest would be fur cutters and furriers—and theirs would be a most inhuman interest.

HAIR CHEMISTRY

The chemical composition of hair shows it to be closely related to the nails of fingers and toes, and to the cuticle (and feathers and hoofs, etc.). It is a sulphur-containing protein or amino acid combination having approximately this elemental content:

Carbon	50	per cent.
Hydrogen	7	" "
Nitrogen	18	" "
Sulphur	4	" "
Oxygen	21	" "

In other words, hair is not unlike the white of egg in the nature of its elements, although it greatly differs from it in physical properties. Of course, there is a considerable deviation in the chemistry of hair, as is true of any organic material. For instance red hair, strangely enough, contains very much less of the explosion loving oxygen than do hairs of other colors.

Hair is insoluble in water hot or cold, and is only destroyed by strong acids and by alkalies. Nitric acid turns any hair yellow and in strong muriatic or sulphuric acids it dissolves, producing a rose-colored liquid.

The substance of hair is more resistant to the forces of decay than practically any tissue substance in the whole body. Often, after death, when flesh and bone will have been resolved to dust the hair remains.

I do not recall the source of the quotation—but the poet who wrote it well knew the persistence of hair growth on a dead man's chest, and a dead woman's head.

> "Borgia, thou once wert almost too august
> And high for adoration; now thou'rt dust.
> All that remains of thee these plaits unfold,
> Calm hair, meandering in pellucid gold."

To which we all react—that Lucrezia dead may keep her gold. We're alive—though goldless and bank-broke.

Indeed, there are processes now in industrial use, where hair and fur fibers are chemically removed from pelt by boiling the whole pelt in certain liquors when the skin will entirely dissolve, leaving the fur and hair practically unaltered.

HAIR MICROSCOPY

As a race characteristic, hair is held by anthropologists to be of extreme importance. Haeckel, in his *History of Creation,* thought the conformation of hair to be nearly as important as the character of language, in the classification of mankind. Hair color, by the way, is not a distinctive racial factor.

If one closely studies the microscopic cross-section of the hair of various races it will be found that almost parallel with their progress

in the world's history—will be this strange observation—that the farther away from origins the race will have reached, the more cylindrical will the hair shaft have become.

Thus the hair shaft of primitive—wooly-haired savages—is flattened and oval in transverse cut—more like a tape than a taper—whereas the fiber of the straight-haired race is nearer the cylindrical form. No wooly-haired nation has ever had an important history.

The microscopic appearance of hair has been very thoroughly studied and there are a few experts in this field today who are said to be able to determine the age, sex and race of an individual through the careful examination of a few stray hairs. Indeed such expert assistance has been of great value in the course of justice as evidenced by records of both the American and Continental courts.

The identification of certain hair fibers was one of the major points in the conviction of Dr. Crippen, the famous or infamous English murderer. And we might even say that the gross examination and identification of hair fibers against a tweed or serge background has more than once strengthened the conviction of many an inquisitive female searcher after philandering facts.

HAIR COLOR

The natural color of hair depends on several factors namely—the diffusion and deposits of actual pigment, air bubble content and the structural surface character of the fiber. The diffused pigment or fundamental color in the cortex, according to its intensity, gives hair a graded brown tint, which, complemented by the sedimented granules in the pith and cortex, and by the optical effects of air bubbles and surface irregularity, affords all the various hair shades encountered.

The coloring material of hair melanin is related to the coloring matter in blood, as is all body colors—and because of this the color of the hair normally matches that of the complexion, and often that of the eyes.

This is so evident in the color scheme of the albino, whose skin—and eye color—and hair are so jointly lacking in pigment. It is interesting to note in passing that according to Pliny, Albania received its name from the fact that albinos were very prevalent in that land.

Nature knows and makes her color blends—and those who dye and bleach their hair—away from its original natural color are offending the artistic eye—because they are upsetting a very fundamental harmony. Of bleaching and dyeing hair, we shall have more to say, a little later.

Tradition has it that disposition and psychic strength are often indicated by hair color and bulk. Indeed hair vigor is quite generally a reflection of general body vigor, and the healthy body usually grows a healthy hair. Of course, all will remember the legend of Samson's strength and the wiles of the curl-clipping Delilah.

RED HEADS

But how many know that red hair is called "hair of a dissembling colour", from the notion that Judas had red hair?

> Rosalind: "His very hair is of the dissembling colour."
> Celia: "Somewhat browner than Judas's."
> *As You Like It*, III, 4.

How many know that there are more red-headed women and black-haired men in jail than there are of fair-haired inmates?

How many know that yellow or red hair is rarely found among maniacs?

Recently a professor, with no examination papers to mark, conducted a careful study of the dispositions of crimson-topped females attending his classes. He insists that the superstition of ancient times which endowed owners of flame-colored hair with red-hot tempers is a myth and a mischief. They have, according to his studies, as sweet a temper as any blonde or brunette.

On the other hand, medical authorities claim that the gland of anger (the adrenal gland) is definitely more trigger acting in red-headed persons.

An old formula book, once owned by William Penn—Proprietor of Pennsylvania, insists that in the preparation of essence of mummy—a most delectable tincture then used in the treatment of epileptic fits—that the mummy of a red-headed youth, who had died a violent death be used in its manufacture—because according to the old book "the blood was fuller and much more acrid."

Possibly this therapeutic use of carrot-headed youngsters may account for the scarcity and hardiness of the surviving scarlet sages.

The Danes who conquered England, were reputed to have red hair and the fair-headed Saxon accordingly hated the color. Even among the old Greek myths we find that Medusa, the terrible Gorgon, had crisp red locks, which were changed to hissing serpents.

Helen of Troy, the most beautiful woman of the world, had red hair. There is a legend that Helen formed a partnership with the devil in return for the secret of everlasting youth, that before she did

so her locks were golden, and that after her visit to the abode of lost spirits her hair grew red.

Cleopatra, "serpent of old Nile," had red hair. She was not beautiful, so they say—at least not on her way to the beauty parlor, yet she made an easy mark of Antony, prince of lovers, whose sole thought thereafter was to please the sweet Egyptian siren.

Good Queen Bess must have thought red hair becoming. It is said she wore a red wig when she wished to look at her best. The ill-fated but lovely Mary, Queen of Scots, is reputed to have had red hair.

Laura, whom Petrarch has immortalized by his verses, first attracted him by her red tresses. He first saw her in church, wearing a mantle of green, down which her glowing red hair rippled. And did she know her color schemes? Of her ensnaring locks Petrarch wrote:

> "The gold and topaz of the sun on snow
> Are shade beside the hair above those eyes."

The ancient Egyptians hated red hair. According to early authorities they had a custom of quietly getting rid of all those unlucky enough to be born with red locks. The Chinese share the aversion, and the Brahmins were forbidden by law to marry a red-haired woman, a silly law which the Brahminesses immediately circumvented by the generous use of dye from black walnuts.

BLONDES

A few short years ago—Anita Loos—catch-phrased—or cat-phrased the silly aphorism—that "gentlemen prefer blondes"—and it was the signal for a wide-spread bleaching spree in the beauty parlors of the nation. School girls of ten and mothers of ten had their heads denatured with peroxide—and the normal tint of their hair turned to a jaundiced yellow; in texture—acquiring a character of something like a burlap bag and in tone somewhere like the front of an American store.

The decolorizing is nearly always done with peroxide of hydrogen, originally used as an antiseptic, but now largely used in textile bleaching too. This oxidizing bleach is activated with ammonia and because of this alkalinity cannot fail but injure the texture of hair.

BLEACHES

Latterly the platinum blonde has appeared—and while most of the Hollywood actresses achieved to theirs with transformations, it is quite possible to peroxide such hair

into existence. Catalytic chemicals are used to push the peroxide into its zenith of bleaching power. And the final bleach is finished off with a rinse in a laundry bluing or acid dyestuff.

In justice to the beauty parlors it should be said that while the early crop of peroxide blondes was a terrible atrocity, more recently the bleaching of hair has been done with less injury and more artistry. But let it be emphatically said here that bleaching and dyeing hair—definitely destroys to varying degrees, the substance and vitality of the fiber.

Gray and white hair of early and late life, particularly of the latter, are just a natural result of a general loss in pigment—and the only way to overcome it is by dying—in one way or another.

ANCIENT TRICHOLOGISTS

Nor need we be too harsh with those modern men and women who make a fetish of their hairy domes —for it has been so ever since the dawn of time. Four thousand years ago Egyptian women had a great variety of hair styles and tricks of dyeing and of bleaching. Indeed the permanent wave, supposedly a recent invention, was used by the sweet sisters of the Nile long before Moses parted the Red Sea. And students of Assyrian history will recall the rhythmic undulations in the chin upholstery of Assyrian dudes.

The Babylonian and Assyrian women, too, were great exterior decorators. They used to circumscribe their eyes and dust their hair with black sulphide of antimony (stibium) and even filled the corners of their optics with this Ethiopian coal dust.

In the halcyon days of Greece and Rome the hair-decorating art achieved to very high eminences. Abundant records in prose and poetry remain to describe the Greek and Roman excesses in dress and style and wigs. Juvenal, the Roman satirist, refers to the boudoir of an emperor's mistress as an elaborate establishment where perfumes and oils and switches and hair-dyes garnered from every corner of empire served to adorn the Roman beauty.

> "She hurries all her handmaids to their task
> Her hair alone will twenty dressers task
> Psecas, their chief, with neck and shoulders bare,
> Trembling considers every sacred hair."

Generally the hair of Romans was a jet black, and blondes were naturally rare and as naturally envied. All sorts of tricks were em-

ployed to bleach the hair—one of the commonest being the "mattiac balls" of rancid goat fat and ashes of oak. Then, too, there was that very delicatessen bleach made of leeches steeped in vinegar until they smelled badly.

Ovid, that garrulous old maid of an author, refers to this iniquity and inaninity of the unnatural hair bleaches in one of his metamorphic songs, in his best "I told you so" manner.

> "Long since I warned you not to use that bleaching lye
> Now there is left no single curl to dye."

And there was the ever-sharp tongue of Martial, that old lady of a poet, who alludes so sharply to the blonde wigs affected by the envious brunettes of the Tiberian boulevards. Sings he—

> "The golden hair that Galla wears
> Is hers—but who'd have thought it.
> She swears it's hers—and true she swears,
> For I know where she bought it."

Now lest we be indicted for too much abuse of femininity—let a Greek poet tell us in a lame translation that loses much of its Athenian finesse, just how a young dandy of Athens dressed his hair, and the rest of his body, preparatory to his Wednesday evening visit. The first line of the verse is, fortunately, redeemed by the lines that follow:

> "He seldom bathes
> But in a gilded tub, and steeps his feet
> And legs in rich Egyptian unguents.
> His neck and chest he rubs with ripe palm oil
> And both his arms with sweet extract of mint.
> His eyebrows and his hair with marjorum,
> His knees and face with essence of wild thyme.'"
>
> (*Antiphanes.*)

To which we remark that the Greek dandy, according to our olfactory impressions must have presented an anatomic ensemble that smelled on the odometric scale—somewhere in between vegetable soup and soap liniment.

But our time is too short to wander so far with our story—and there are many, many hair-raising tales which must be left untold.

PRIMATE TRAITS When, earlier in the lecture we alluded to man's aversion to the inevitable eventual loss of his hair as being a throw-back to the far-away day when he lost his fuzzy overalls, we might also have noted that the actual business of getting bald

—and growing gray are just primate traits*—which, according to authorities in such matters, we share with other members of the primate group—the monkeys, apes and lemurs. These animals get bald spots on their heads although that kind of a monkey never read a strip of ticker tape or worried over a moratorium or wore a hat.

By the way the silly statement that hats produce baldness was effectively contradicted by hair specialists who made a study during the great world war of the effects of the metal war helmets upon hair. They found that even though dirt and parasites were often natural accompaniments of the helmet—the hair seemed to have suffered none from the experience. History, too, tells us that baldness existed long before hats were even worn.

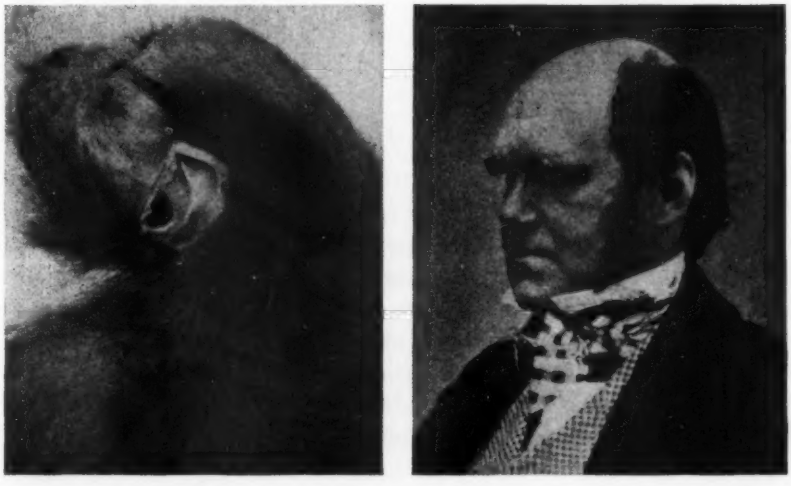

Fig. 5—Showing a like baldness in a South American monkey and in the author of "The Origin of Species," Charles Darwin.—(From Science Service.)

BALD HEADS

Such renowned celebrities as Socrates, Caesar and Napoleon came early to bald heads, and even Aesculapius and Hippocrates, grandsires of medicine, were as bald as Father Time himself. The type of baldness that perennially decorates the front row at "the Follies" is known to this day as the "baldness of Hippocrates."

Some people believe that singeing the hair prevents baldness on the theory that the hair is full of sap, singeing sealing the sap so that

*See *Human Hair and Primate Patterning.* By Gerrit S. Miller, Jr., Curator, Division of Mammals, U. S. National Museum.

it cannot run out. Hair has no more sap than a walking stick—unless it be the "sap" who owns it.

Fig. 6—Singed hair fiber, showing fraying of end. Magnification about 100x.—(P. P. R.)

And not only do monkeys, lemurs and apes get gray and bald, but the very shapes of their bald spots and the places where the first thin spots or gray patches show are the same as in men and women. The truth of the matter with respect to baldness is that the actual mechanism of the body processes involved has not yet been completely disclosed by scientific research. Of course, certain types of baldness due to specific diseases such as syphilis, the specific alopecias and psoriasis, etc., are frequently curable and cured with the disease—but the baldness here discussed is the baldness that is in many natural and inevitable.

This baldness is a normal baldness, an idiopathic baldness, and said to be associated with some seemingly inherited function or dysfunction of the endocrine glands. Depending, then, upon the operation of these little factories that pour their products into the bloodstream you are either bald, billiard-ball bald—or not bald. Cures have been tried ever since Ses, mother of Teta, king of Upper and Lower Egypt, compounded a remedy for baldness from dogs' toes, donkeys' hoofs and dates. This was more than 4000 years ago, according to the famous Ebers Papyrus, a medical treatise now in possession of the University of Leipzig.

GLAND TIDINGS

Recently a physician in Chicago, Dr. B. Norman Bengtson, reported in the *Journal of the American Medical Association,* that he had been successful in making hair grow on persons whom he had under treatment. The fact that this report appeared in the official journal of organized medicine in the United States has lent great impetus to the doctor's theories.

He used the pituitary gland, both the anterior and posterior lobes in his treatment, administering them not by rubbing, but by mouth

and by injection. In certain types of baldness, he claims to have had a startling success, but his experiments are not as yet complete.

Quacks—those parasites and pirates who haunt the trail of any new and successful application of medicine were immediately ready to exploit these gland tidings. But so far as our information goes no such quackeries have as yet appeared on their hair-tonic market.

AN IRISH HAIR TONIC

An interesting formula for a hair tonic, culled from an old Celtic work, is as follows, and proves that quacks existed long before this age of ballyhoo and blarney.

"With mice fill an earthen pipkin, close the mouth with clay and let it be buried beneath the hearthstone, but so as the fire's too great heat reach it not. So be it for one year, at the end of which take out whatever may be there. For baldness it is great. But it is urgent that whoever shall handle it have a glove on his hand, lest at his fingers' ends the hair come sprouting forth."

Kittens take two weeks to open their little eyes—but there are humans whose mental eyes seem closed long after their kindergarten days. And it is these human kittens who largely furnish the food for hungry quacks and charlatans. They are the believing kind who hearken to the claims of every noisy quack—and who fall easy prey to the wiles of every occurring crook. They form the undiminishing multitude that still believes in the creative functions of hair tonics—in the face lifting wrinkle erasing ability of creams—in one night bunion banishers, and in two-day chest or hip removers.

Open the advertising pages of some of the Beauty or Stage or Physical Culture gagazines and behold the display of deftly baited tackle waiting for the poor fish to swim by. Then gaze with awe at the "befores" and "afters" on parade. There is Exhibit A—a line picture of Mr. Elias Freely, of Haddonfield, N. G., twenty minutes before he sprinkled upon his simonized napless scalp a swig or so of someone's hair oil. And there he is, according to the artist, just about twenty minutes afterward. Look at his cranial upholstery now!

HAIR STATISTICS

Said one statistical stalwart in the British House of Commons quite recently:

"The British Empire annually spends more money on its hair tonics than it does on its Navy." Which only proves that John Bull is more concerned over dishairment than disarmament, and that he fears a headnaught more than he does a dreadnaught. Nor

has John Bull a monopoly on the kind of gullibility that has made fortunes galore for hair-tonic promoters.

Statistics show that the average woman spends $50.00 a year on cosmetics and beauty culture, striking a medium between the practically extinct "just soap and water" advocates and the constantly increasing number who make a practice of regular professional beauty treatments.

Of this $50.00, one-sixth is spent for face powder and rouge; one-sixth for creams; one-sixth for perfumes, toilet water, talc and other toilet powders; one-sixth for dentrifices; one-sixth for hair tonics, shampoos, and sh-h—— hair dyes; this one-sixth representing a total of over 20 millions; and the remaining sixth for miscellaneous preparations and for treatments.

Two billion dollars is the amount of money spent annually for cosmetics and hair and beauty treatments, by American women, according to another authority.

Research on the theatrical stage and in society in New York intimates that the bulk of that almost $2,000,000,000 of beauty buying is done by women who were born to bloom unsung and unnoticed by the world—a vast section of the feminine population whose moods and skins need to be softened by the gentle manipulation of expert fingers weighted with fragrant creams, and whose talent for chatty conversation finds an outlet and an audience in thick and tepid air that smells of soap and singed and drying hair.

With America's womanhood today above the neck the upkeep is especially high. For with the bob, the marcel, the shingle, the permanent, the neck shave and ear trim, the cost of the hair keep is in inverse proportion to its scarcity. And man is as much of an offender as is his mate in so stepping up the face value of Americans, for his barber shop investments, though furtively and slyly incurred, amount to incredible sums.

THE HAIR TONIC The tragedy, or perhaps the comedy of this hair-tonic business is the foolishness and the impossibleness of the whole thing. Let it be said here that the real students in the field of tonsiculture are united in their ridicule of specific value of the hair tonic and are in agreement that the spasmodic application of the so-called hair invigorators and restorers may be expected to grow hair on a truly bald spot with as much certainty as sprinkling a bit of it on a

moth-eaten Brussels rug may be expected there to develop a chenile nap.

Hair tonics are available in the stores in very convenient sprinkling and massaging containers, and they contain almost every drug in the Pharmacopœia. Bugs, roots, alkaloids such as quinine and pilocarpine, poisons such as phenol, bichloride of mercury, sugar of lead, and all manner of minerals and medicines are compounded into these hopeless tinctures. The more poisonous these tonics are the greater is the likelihood to advertise them as safe.

Recently cholesterol compounds were heralded as having much value in these directions, and especially when the violet ray or the ultra-violet emanations were subsequently applied. Resorcinol and betanaphthol—from the coal tar barrel once held great vogue as hair invigorators—but have latterly fallen into disrepute—particularly because tonics containing them frequently developed brown spots, leopard like, on the heads of generous users.

Indeed, you may mention any drug you like—and somewhere, sometime, someone will have used it in hair lotions.

DANDRUFF DISSIPATORS

Since dandruff is usually associated with falling or decaying hair, hair tonics are frequently expected to do a double duty, namely, cure the dandruff and grow hair as well. From the poisonous composition they frequently have they might be expected to be valuable not only in the treatment of the stationary dandruff, but also to cure that variety of dandruff known colloquially as jumping dandruff, or more scientifically as pediculosis.

Dandruff (pityriasis) is not a germ disease as so many persons believe. It is merely a natural throwing off of dead skin cells which have dried and lost their usefulness. These dead scales are covered with skin grease and dirt and many low forms of germ life which find in this scurf a merry place wherein to raise their families. Thus a scant shedding of dandruff is not a cause for alarm, although lack of scalp care often produces so much irritating dandruff as to choke the hair follicles with grease and dirt. The hair is thus deprived of air and nourishment and will eventually shed—never to return.

SANITY AND SANITATION

Neither dandruff lotions nor hair restorers nor the foolish mange cures are needed to avert or cure the conditions described above. Cleanliness, sensible diet, scalp massage, and an occasional oil treatment are the only remedies at hand—and when properly administered, will provide certain relief.

Indeed in this whole matter of the care of the hair, the common-sense viewpoint dictates the use of only the most gentle applications—the least quantity of chemicals—and a reasonable cleanliness. Early care of the hair will insure against its early loss—and after it has been long neglected no treatment will return it to its former vogue and vigor.

HAIR DYES HAIR DIES!

Hair dyes are a complicated group of preparations, and in this natural land of ours more hair dyes are used than anyone suspects. Most of them are of dangerous composition, particularly the group containing coal-tar compounds such as the paraphenylenediamin group. Their indiscriminate use can produce not only local irritations but constitutional diseases as well, and death has been known to ensue from their over-use or through idiosyncracy.

One kind of hair dye, the silver type, actually silver plates the hair fiber, only that the silver is in such a form that instead of being lustrous and metallic it occurs as a microscopic black coating. Lead compounds, too, are used for dyeing as well as for alleged tonic purposes.

The safest of the hair dyes are the vegetable colors mordanted on with such compounds as alum, etc. Henna, walnut, etc., are used in such applications.

RINSES

The so-called rinses are quite popular in our present-day beauty emporia. For the blonde there is the old chamomile or lemon rinse, to say nothing of the weak peroxide wash. For the brunette the henna rinse changes a characterless brown to a becoming auburn and when used on black hair it brings out beautiful highlights.

But pity the poor customer whose beautician is color crazy—for with these tinted rinses erroneously applied—there are frequently produced colors so hideous and grotesque that they remove all doubt as to the victims claim to even a paltry pulchritude.

SUPERFLUOUS HAIR

The amenities of convention require the removal of hair from body surfaces, and it is a much easier chemical proposition to remove superfluous hair than to coax its growth. Certain chemicals such as sulphides of barium and strontium, arsenates, etc., are used for this purpose on the living

human as well as on the carcasses of animals whose skin is desired for the tanning industries. In both cases they operate by the same technic.

Generally all the depilatories are of the same base, only the perfume being different. The cheaper types, not so well perfumed, leave behind an odor suggesting a recently butchered fowl, whereas for three dollars more one can be secured whose trail is much more cleverly protected by captivating perfume. A Gillette razor, of course, makes a splendid temporary depilatory. Nor must we forget the epilating waxes which work on the principle of a porous plaster, pulling out the hair by the roots. Then, too, there is the electric needle, a somewhat painful and tedious, though very thorough depilatory requiring expert manipulation. The X-ray has also been used for this purpose, and like the electric needle gives permanent results—but frequently leaving in its wake a trail of affections and afflictions. Atrophy of the limbs has resulted from such treatments.

If milady, in her search for beauty, seeks the removal of oddly located hair growths from visible locations she will do well to be extremely cautious in her choice of depilatory.

The recently advertised depilatory for men "Snow" through whose use shaving becomes unnecessary is as dangerous as any other sulphide product if constantly used.

THALLIUM POISONING

One of the most atrocious cosmetics ever introduced to the American public was Koremlu, or thallium acetate depilatory. Thallium acetate, a well-known rat poison, as exhibited in this preparation, is said to have been responsible for over a hundred deaths.

Although there were no federal cosmetic laws which prohibited the manufacture and sale of this very effective but frequently fatal hair killer, it finally passed out of existence because of its own iniquities. The Koremlu Company with $2,500,000 in damage claims against it, went into bankruptcy in July, 1932.

SHAMPOOS

A word or two, now about shampoos. There is available in the shops some fifty-seven varieties of these head-washing liquids, none of them really essential. Shampooing the hair should be seldom practiced, certainly not oftener than once a week. Native tribes who never shampoo are noted for their luxuriance of hair growth. Of course, they are also noted for their cranial animalcules. A neutral soap like Ivory, serves as well as any expensive shampoo.

Human hair on location has been, up to now, the subject of our comments. Let us now, for a few brief moments consider it away from home.

HUMAN HAIR IN THE ARTS

The use of human hair in the arts and industries is more extensive than most persons know. Thus for the manufacture of certain types of filters for oil extraction nothing is comparable to it in strength and durability. China annually exports a tremendous quantity of human hair to America. Recently when China officially adopted Occidental customs and ordered the clipping of the queu or pigtail which the Chinese race had affected for hundreds of years, there was so much human hair available that it became a veritable drug on the market. And it is no pleasant soliloquy for those who still wear curls and frizzes to be informed that dead Chinese are shorn of their hair prior to their burial —so that it may be made available for another to wear.

Hair nets are also made from human hair, China supplying the brunettes and Germany and the Nordic countries supplying the blondes and the grays. It is said that this domestic industry is a flourishing one in China, but that the price of the individual hair net F. O. B.—the Chinese ports, is less than a half a cent each.

CRANIAL CAMOUFLAGE

Wigs, toupees, buns, puffs, switches, rats, rolls and chignons, frizzes, curls, transformations, periwigs, perruques and other varieties of cranial camouflage are also made from human hair. Today, however, except for masquerading purposes, such artificialities are rarely worn by men or women.

How much saner after all, is the honest bobbing fashion, where there is no deception, no false padding and bolstering and no wearing of someone else's discarded hair!

THE BOB

Tradition has it that Mrs. Vernon Castle commenced the bobbing fad—but again one only has to look to Egypt—and Egyptian relics to find that the goo-goo-eyed daughters of Pharaoh preceded the Castle cut and the shingle cut by several thousand years.

The customs of all ages and climes in the matter of hairdressing have been indeed diversified. Did you know that one single tuft is left on the shaven crown of a Mussulman, for Mahomet to grasp hold of when drawing the deceased to Paradise? And that the scalp-lock

of the North American Indians, left on the otherwise bald head was for a conquering enemy to seize when he tore off the scalp.

HAIRODDITIES

Did you know that the moustache and the goatee affected by the Crusaders of old were regarded as forming the sign of the cross?

Did you know that orthodox Jews expect the new bride to shave her head so that she be attractive only to her husband? And what a handicap to set for any bride!

Did you know, that in the reign of the Louis XV French women, by means of rats and buns, and other sundry devices, elevated their hair in ridiculous columns, often topped with feathers and ship models, to say nothing of nightingales' nests and roosts for robins, some achieving a height of over two feet, and necessitating the wearer kneeling when abroad in her covered coach—and carefully avoiding transoms and chandeliers when moving about indoors.

Can you picture such a creature squeezing in a yellow cab?

It was a Frenchman, Marcel, who in 1887 inaugurated the waves and conjured the curls, that have ever since borne his name. The invention of the permanent wave was a few years earlier. In 1873 Ellen Crain, of Kansas City, was granted a patent on an apparatus consisting of a metallic tube around which the hair was curled, a permanent wave being achieved by passing live steam through the tube. Practically all the modern wavers are patterned after this early model.

THE PERMANENT WAVE

The operation of permanent waving has progressed rapidly and seems to work no great injury on the hair when intelligently done. Only where too much heat or where alkalies are used in the process—will the permanent wave become a permanent injury to the fiber.

. . . . . .

And thus we come abruptly to the end of our hairy discourse. We have perforce, omitted much. The diseases of hair have been ignored—as have many other aspects of trichology.

FINIS!

Possibly, too, we have disappointed those who boldly, baldly, came in search of an essence of hope with the application of which their annointed skulls might once again break out in hairy persiflage. We leave with them only the observation that while hope springs eternal from the human breast—hair once lost is lost forever—just exactly as when youth, the dream, departs—it takes something from our hearts and it never comes again!

BACTERICIDAL EFFICIENCY OF 2 PER CENT. PHENOL OINTMENTS

By Louis Gershenfeld, Ph. M., B. Sc., P. D.,[1]
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IN AN article by Husa and Radin (*Journal A. Ph. A.*, September, 1932) these authors conclude that "tests made on 5 per cent. phenol ointments containing water, anhydrous lanolin and petrolatum showed that the presence of small portions of water is unimportant, but that the relative proportion of anhydrous lanolin and petrolatum is the deciding factor in determining the antiseptic properties." Accordingly they recommend for inclusion in the U. S. P. XI an ointment of the following composition: "Phenol, 2 Gm.; Wool Fat, 24.5 Gm.; Petrolatum, 73.5 Gm. This ointment shows definite antiseptic properties in the Reddish Test, although the U. S. P. X Ointment of Phenol shows no antiseptic value by the same test." Tests conducted by the Food and Drug Administration of the United States Department of Agriculture did not coincide with the results obtained by Husa and Radin. At the suggestion of the Chairman of the Revision Committee of the Pharmacopœia, Professor E. Fullerton Cook, and in agreement wtih Professor William J. Husa and Dr. F. J. Cullen, the following investigations were conducted.

Three ointments of the same composition but prepared in three different laboratories (University of Florida, P. C. P. and S., and the Food and Drug Administration laboratory) were tested for their bactericidal efficiency. The formula of the ointment is: 2.0 Gm. of Phenol; 24.5 Gm. of Lanolin (Anhydrous); and 73.5 Gm. of Petrolatum. The official agar plate method as given on page 12 of Circular 198, United States Food and Drug Administration Methods of Testing Antiseptics and Disinfectants, was the procedure employed in performing the efficiency tests. There were some variations in some of the tests because of the fact that Professor Husa varied the formula of the culture media (see his article quoted above). Both Professor Husa and the F. D. A. used the same formula for the bouillon em-

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ployed for growing the Staphylococcus aureus but different formulas were used for the agar medium. The formula required by the standard method (employed by the F. D. A.) is: 5 Gm. of Beef extract; 10 Gm. of Peptone; 5 Gm. of Sodium Chloride; 15 Gm. of Agar and 1000 cc. of water; hydrogen ion concentration of 7.2-7.4. Husa's formula for the agar given in his article "The Antiseptic Value of Phenol Ointments" (*Journal of the American Pharmaceutical Association,* Vol. 21, No. 9, page 863, September 1932) is: 3 Gm. Beef extract; 5 Gm. Peptone; 15 Gm. Agar; and 1000 cc. of water; hydrogen ion concentration of 6.8. In a personal communication, Professor Husta states that the hydrogen ion concentration of agar was 7.0 to 7.2.

Therefore, three lots of agar were prepared, one made according to the standard requirements and two made according to Professor Husa's fomula, one lot having a hydrogen ion concentration of 6.8 and the other a hydrogen ion concentration of 7.0 to 7.2. Cultures of the test organism, Staphylococcus aureus as used by them in their tests were obtained from the F. D. A. laboratory and from Professor Husa. Tests were then performed using each organism with each different batch of agar, making six different combinations as shown in the table. It was soon apparent that the variation in formula or pH of the agar and the use of the two different cultures of Staphylococcus aureus made no difference upon the results obtained. The majority of the tests were performed using the standard (government) agar and Staphylococcus aureus and Professor Husa's agar (pH 6.8) and Staphylococcus aureus.

One-half gram and 1.25 Gm. of ointment were employed, the former being the quantity used by Professor Husa and the latter the quantity employed by the F. D. A. In each case the ointment was spread over an area 2 cm. square. A 2 per cent. solution of phenol in agar was prepared and was used as a control in the same manner as the ointments. Controls were also made using petrolatum alone and petrolatum and adeps lanæ, which are the components of the base of the ointment. The following table (I) gives the results of this series of tests.

Observations of Table No. I

Forty tests in all were made, twenty of these with the ointment prepared in the operative pharmacy department of the Philadelphia College of Pharmacy and Science, fifteen tests performed with the

TABLE I

BACTERICIDAL EFFICIENCY OF 2% OINTMENTS

Organism and Agar used	P. C. P. Ointment	Ointment sent by Professor Husa	Ointment sent by F. D. A.	2% Phenol in Agar medium	Petrolatum Control
Husa's Staph. and F. D. A. Staph. pH 7.2-7.4	0.5 Gm.—no zone 1.25 Gm.—no zone	0.5 Gm.—no zone 1.25 Gm.—1-2 mm. zone of lighter growth (Culture = Staph.)	0.5 Gm.—small (2 mm.) ¼ way around (lighter growth), (Culture = Staph.)	(about 0.5 Gm.) 5 mm. inhibition zone	0.5 Gm.—no zone 1.25 Gm.—no zone
Husa's Staph. and and Husa's Agar (Formula #2) pH 7.0-7.2	0.5 Gm.—no zone 1.25 Gm.—no zone			(about 0.5 Gm.) 5 mm. inhibition zone	1.25 Gm.—no zone
F. D. A. Agar and Husa's Agar (Formula #1) pH 6.8-7.0	0.5 Gm.—no zone 1.25 Gm.—1.5 mm. zone (Culture = Staph.)			(about 0.5 Gm.) 4 mm. inhibition zone	1.25 Gm.—no zone
F. D. A. Staph. and Husa's Agar (2) pH 7.0-7.2	0.5 Gm.—no zone 1.25 Gm.—no zone	0.5 Gm. lighter zone (2 mm.) ¼ way around (Culture = Staph.)	0.5 Gm.—1-2 mm. zone (lighter growth), (Culture = Staph.)	(about 0.5 Gm.) 4 mm. inhibition zone	1.25 Gm.—no zone

TABLE I—CONTINUED

TABLE I—Continued
Bactericidal Efficiency of 2% Ointments

Husa's Staph. and Husa's Agar (1) pH 6.8-7.0	0.5 Gm.—no zone 0.5 Gm.—no zone 0.5 Gm.—1-2 mm. zone of lighter growth (¾ way around (Culture = Staph.) — 1.25 Gm.—no zone 1.25 Gm.—no zone 1.25 Gm.—no zone	0.5 Gm.—no zone 0.5 Gm.—no zone 0.5 Gm.—1 mm. zone of lighter growth—half way around (Culture = Staph.) 1.25 Gm.—zone 2-3 mm. half way around (Culture = Staph.) 1.25 Gm.—2-5 mm. zone (entire) (Culture = Staph.) 1.25 Gm.—slight zone of lighter growth (Culture = Staph.)	1.25 Gm.—3 mm. zone half way around (Culture = Staph.)	(about 0.5 Gm.) 10 mm. clear zone (about 0.5 Gm.) 3 mm. no gr., then 1 mm. zone of heavy growth and 3 mm. zone of lighter growth. Culture 2 mm. from edge of phenol = Staph. (about 0.5 Gm.)—6 mm. inhibition zone	1.25 Gm.—no zone — Petrolatum and adeps lanae 1.25 Gm.—no zone
F. D. A. Staph. and F. D. A. Agar pH 7.2-7.4	0.5 Gm.—no zone 1.25 Gm. (2 mm. zone), (Culture = Staph.) 0.5 Gm.—½ mm. zone of lighter growth (Culture = Staph.) 0.5 Gm.—no zone 1.25 Gm.—no zone 1.25 Gm.—no zone	0.5 Gm.—no zone 1.25 Gm.—1 mm. zone half way around (Culture = Staph.) 0.5 Gm. = 3 mm. clear zone (entire), (Culture = Staph.) 1.25 Gm. = 2.6 mm. Clear zone (entire) (Culture = Staph.) 0.5 Gm.—no zone 1.25 Gm. = 1-5 mm. clear zone (entire), (Culture = Staph.)	0.5 Gm.—no zone 1.25 Gm.—2-3 mm. zone of lighter gr. (entire) Culture = Staph.	About 0.5 Gm. 4 mm. zone (about 0.5 Gm.) 6-9 mm. zone colonies within zone (about 0.5 Gm.) 5 mm. clear zone ring of growth and 5 mm. zone of inhibition (about 0.5 Gm.) 2 mm. clear zone, 5 mm. zone of lighter growth. Culture of 2 mm. zone = Staph. Culture of Agar next to Phenol = no growth	1.25 Gm.—no zone 1.25 Gm.—no zone 1.25 Gm.—no zone — Petrolatum and Adeps Lanae 1.25 Gm.—no zone

ointment submitted by Professor Husa and five tests performed with the ointment sent by Dr. Cullen of the Food and Drug Administration of Washington. In twenty-two of the forty tests no zone was observed around the ointment. In the eighteen tests which were conducted in which zones (so designated) were observed, eleven of the latter revealed a shaded area adjacent to the ointment which gave the appearance of a slight stimulation zone, which averaged one millimeter and in no instance not over two millimeters in diameter. In six cases this shaded area giving the appearance of a stimulation zone was from two to five millimeters in diameter. The largest stimulation zone observed only in one instance was an irregular zone of from two to six millimeters in diameter. The shaded areas or apparent inhibition zones in the eighteen cases cited were entire in eleven of the tests and only partial in the remainder and in nine instances growth was evident therein. In all instances where zones were present tubes of bouillon were inoculated with material from these zones. In every case, even from areas close to the ointment, growth was observed in the subculture tubes, showing that the *2 per cent. phenol ointment (petrolatum—anhydrous lanolin base) when exerting any beneficial effects produces a bacteriostatic action only.* In the case of the 2 per cent. phenol agar there was always a zone, as indicated by the chart. Subculture in one case made 2 mm. from the edge of the phenol in the agar base showed growth, but when made closer to the phenol agar no growth was observed in the sub-culture tubes.

Effect of Water in the Above and Other Formulas

Two per cent. phenol ointments in a base of anhydrous lanolin 25 per cent. and petrolatum 75 per cent. with varying amounts of water were prepared and tested for their bacteriostatic and bactericidal action. Five, 10, 20 and 30 per cent. of water were added but the latter did not remain in combination with the petrolatum and anhydrous lanolin in the 20 and 30 per cent. ointments. The addition of water to the 2 per cent. phenol in the petrolatum 75 per cent., anhydrous lanolin 25 per cent. base did not, in any instance, increase the efficiency of these ointments. (See Table II.)

Two per cent. phenol in petrolatum alone, and a 2 per cent. phenol with 2 per cent. glycerin in a base of petrolatum 75 per cent. and anhydrous lanolin 25 per cent., were prepared and tested for their bactericidal efficiency. It will be noted that the phenol in plain petrolatum exhibited apparent stimulation zones in most instances

TABLE II

BACTERICIDAL EFFICIENCY OF 2% PHENOL OINTMENTS

Preparation			Zone: Number of Tests indicated in each case with 1.25 gm. of preparation	Sub-Cultures: Distance from ointment in millimeters
Phenol		2%	2-4 mm. Zone (of lighter growth)	1 mm. = Staph.
Base		93%		
Lanolin (anhydrous)	25%		2-4 mm. Zone (of lighter growth)	2 mm. = Staph.
Petrolatum	75%		1-2 mm. Zone (¾ way around)	1-2 mm. = Staph.
Water		5%		
Phenol		2%	no Zone	
Base		88%		
Lanolin (anhydrous)	25%		no Zone	
Petrolatum	75%		2 mm. Zone (lighter growth)	1 mm. = Staph.
Water		10%		
Phenol		2%	4-6 mm. Zone (¾ way around)	2-4 mm. = Staph. 5 mm. = Staph.
Base		78%		
Lanolin (anhydrous)	25%		no Zone	
Petrolatum	75%		2-3 mm. Zone (lighter growth)	1 mm. = Staph.
Water		20%	2-6 mm. clear Zone	6 mm. = Staph.
Phenol		2%	2-3 mm. Zone (lighter growth)	2 mm. = Staph.
Base		68%		2 mm. = Staph.
Lanolin (anhydrous)	25%		2-3 mm. Zone (lighter growth)	
Petrolatum	75%		no Zone	
Water		30%	no Zone	
Phenol		2%	no Zone	
Glycerin		2%	no Zone	
Base		96%	1-2 mm. Zone (lighter growth)	1 mm. = Staph.
Lanolin (anhydrous)	25%			
Petrolatum	75%		no Zone	
Phenol		2%	no Zone	
Petrolatum		98%	2-5 mm. clear Zone	
			2-3 mm. Zone (lighter growth)	
			2-6 mm. Zone (clear)	4-5 mm. = Staph.
			3-4 mm. Zone	1-2 mm. = Staph.
			3 mm. Zone	3-4 mm. = Staph.
			no Zone	1-3 mm. = Staph.
Phenol		2%	3-5 mm. clear Zone then 5 mm. Zone of lighter growth	2-3 mm. = No gr. 4 mm. = No gr.
in agar base.			7 mm. clear Zone then 4 mm. Zone of lighter growth	
			2-4 mm. clear Zone then 5 mm. Zone of lighter growth	
			5-9 mm. Zone	2-3 mm. = No gr. 5 mm. = Staph.

(five out of seven tests) while when 2 per cent. glycerin was added to the same mixture only in one instance out of four tests was there observed a shaded area. The 2 per cent. phenol in an agar base displayed clear zones surrounded by zones of lighter growth. Subcultures made from agar in the clear areas showed no growth, displaying bactericidal action. The phenol agar was kept in ointment tubes and a separation of liquid from the agar was noted when this material (kept for long periods of time) was added to the solid agar in the Petri dish.

Conclusions and Remarks

Two per cent. of phenol was only employed in this test inasmuch as it was the percentage present in the ointment recommended to be included in the U. S. P. and the particular strength which was present in the ointments the bactericidal efficiency tests of which were in dispute. The authors wish to point out the fact that phenol is probably not completely soluble in the jelly petrolatum base to the extent of 2 per cent. This observation if correct may have an important bearing on the appearance of shaded areas simulating stimulation zones in the tests performed for determining the bactericidal efficiency of ointments. If a portion of the phenol is not completely soluble but remains in a finely divided mechanical suspension one can account for variances in results.

We have found as have other workers (and as mentioned by Dr. F. J. Cullen in a private communication) that various physical factors independent of the composition of the ointment under investigation will influence the appearance of inhibition zones when ointments are placed on agar plates seeded with bacteria. The methods of applying the ointment or the fact that some ointments at body temperature in the incubator may liquefy will influence the inhibition zone phenomena. In the case of the latter it may only liquefy sufficiently so that a thin and almost imperceptible layer of the material runs over and surrounds the surface of the agar near the ointment proper, with the result that there is a physical interference to the proper development of bacterial colonies. We have always employed porous clay tops for our Petri dishes, as misleading and obscure findings may be apparent when glass tops are used. Also when using glass tops it is impossible to invert the dish to take care of water of condensation, as the ointment may fall or at least loosen sufficiently, and thus not make a close contact with the agar medium. When using

porous clay tops turning plates upside down is not necessary. We have always employed an agar medium either freshly prepared or recently prepared, as reports have been made from time to time that agar medium from which water has evaporated may at times account for the appearance of suspicious stimulation zones.

From the tests and findings reported herein we have never obtained (except in but five instances out of forty-seven (47) tests) a true distinct zone of inhibition from an ointment containing 2 Gm. of phenol and 98 Gm. of petrolatum or 2 Gm. of phenol, 73.5 Gm. of petrolatum and 24.5 Gm. of anhydrous lanolin. The 2 per cent. phenol ointments (with bases as herein indicated) do not display bactericidal action with the agar plate test as given in the United States Department of Agriculture, Circular 198. The question of the inhibition of growth with these same ointments may give rise to discussion. We are, however, inclined to be of the opinion that unless the shaded area, adjacent to the ointment under investigation gives the appearance of a distinct inhibition zone which is entire or almost so, at least several millimeters in diameter, and unless these characteristics appear at all times or at least most of the times when tests are conducted, such an ointment should not be designated as displaying inhibitory properties. Where tests reveal apparent slight partial inhibition zones which are indistinct, one could only conclude very feeble inhibitory properties, even if physical factors are disregarded. In lieu of this fact and inasmuch as it may be difficult to rule out all physical factors, it would be best not to give the benefit of the doubt to the ointment. This is especially true when we consider the fact that it is possible to employ other ointment bases for the same active antiseptic agent which under identical conditions of testing leave no question of doubt as to the bactericidal or bacteriostatic efficacy of the product.

We accordingly conclude that 2 per cent. phenol in petrolatum or in a mixture of petrolatum and anhydrous wool fat (to which water may or may not have been added) does not display bactericidal or worthwhile inhibitory action in accordance with the agar plate test which for want of a better technique is at present regarded as the best available method for the gross indication of the antiseptic possibility of an ointment. We would recommend a consideration of other ointment bases both for phenol and other agents where the bactericidal efficiency is the uppermost thought in the mind of the diagnostician prescribing this product. (See paper on ointment bases by authors in this issue of this JOURNAL.)

OINTMENT BASES FOR BACTERICIDAL AGENTS

By Louis Gershenfeld, Ph. M., B. Sc., P. D.,[1]
and
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SINCE 2 per cent. phenol in plain agar medium (an aqueous base) displayed bactericidal efficiency not apparent in a petrolatum or a petrolatum and anhydrous lanolin base (see article on the "Bactericidal Efficiency of 2 Per Cent. Phenol Ointments" by the authors in this issue), other bases were prepared and 2 per cent. phenol added to each of these. It was thought that perhaps such bases containing this amount of phenol and which display bactericidal efficiency may be of worthwhile or even of greater value for consideration (as better vehicles than petrolatum or petrolatum and lanolin) to be admitted as official preparations.

The following bases (with their designations and formulas) prepared by Leo Lorand in the pharmaceutical laboratory of the Philadelphia College of Pharmacy and Science were employed and 2 per cent. phenol was incorporated as the bactericidal agent:

X—phenol, 2 per cent.; xerol (glycerin monostearate) 10 per cent.; glycerin 10 per cent.; water, 78 per cent.

XR—phenol 2 per cent.; Russian oil, 5 per cent.; paraffin, 1 per cent.; xerol 10 per cent.; glycerin, 10 per cent.; water, 72 per cent.

T—phenol 2 per cent.; tegacid, 12 per cent.; glycerin, 10 per cent. and water, 76 per cent.

V—phenol 2 per cent.; vanishing cream, 98 per cent. The vanishing cream consisted of stearic acid, triethanolamine, glycerine and water.

OP—phenol 2 per cent.; white petrolatum and stiffener, 56 per cent.; oxycholesterol, 30 per cent.; glycerin, 2 per cent.; and water, 10 per cent.

S—Unguentum Stero-glycerinatum (Recipe Book, A. Ph. A.).

B-I and B-II—phenol, 2 per cent.; base, 98 per cent.

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Three samples of each (1.25 Gm. in every instance) were tested in each case except with S (vanishing cream base), OP, B-I and B-II where two tests were made. The official Agar Plate Method (page 12, Circular 198, F. D. A. Methods of Testing Antiseptics and Disinfectants) was employed. Control tests of the bases (vehicles) themselves, without the phenol (1.25 Gm. in each case), revealed No Zones in every instance.

TABLE A

Bactericidal Efficiency of 2% Phenol Ointments

Preparation	Zone Number of tests indicated in each case with 1.25 Gm. of preparation	Sub-Cultures Made from zone of greatest diameter — Distance from ointment in millimeters
X Phenol 2% *(1) (glycerin monostearate 10%, glycerin 10%, water 78%)	12-15 mm. zone 8-11 mm. zone 10 mm. zone	(1) 3 mm. no growth (2) 5-7 mm. growth (Staph.) (3) 12 mm. growth (Staph.)
XR Phenol 2% (Russian oil 5%, paraffin 1%) *(1) (glycerin monostearate 10%, glycerin 10%, water 72%)	10 mm. zone 2-8 mm. zone 3 mm. clear zone and then a 4-5 mm. zone of lighter growth	(1) 1-3 mm. no growth (2) 3-5 mm. growth (Staph.) (3) 7 mm. growth (Staph.)
T Phenol 2% *(2) (glycerin monostearate combination 12%, glycerin 10%, tap water 76%)	10 mm. zone 10 mm. zone 8-10 mm. zone	(1) 2-3 mm. no growth (2) 5-6 mm. growth (Staph.) (3) 8-9 mm. growth (Staph.)
V Phenol 2% (Vanishing cream 98%), the formula of which was: Stearic acid 15.2%, *(3) Triethanolamine 0.76%, water 75.22%, glycerin 9%	10 mm. zone 10 mm. zone 3-10 mm. zone	(1) 2-3 mm. no growth (2) 5-7 mm. growth (Staph.) (3) 8-9 mm. growth (Staph.)
S Unguentum stero-glycerinatum	6-10 mm. zone 6-10 mm. zone	(1) 1 mm. no growth (2) 4 mm. growth (Staph.) (3) 9 mm. growth (Staph.)
OP Phenol 2% (White petrolatum and stiffener 56%, oxycholesterol 30%, glycerin 2%, water 10%)	4-9 mm. clear zone (¾ way around ointment) 1-6 mm. zone (entire)	(1) 1-3 mm. growth (Staph.) 1-3 mm. growth Findings here reveal bacteriostatic action only

TABLE A—CONTINUED

BACTERICIDAL EFFICIENCY OF 2% PHENOL OINTMENTS

Preparation		Zone: Number of tests indicated in each case with 1.25 Gm. of preparation	Sub-Cultures Made from zone of greatest diameter: Distance from ointment in millimeters
B-I			
Phenol	2%	7-10 zone	1 mm. = Staph.
Base	98%		
Stearic acid	18.4		2-3 mm. = Staph.
*(3) Triethanolamine	1.38	3 mm. zone (lighter growth)	5 mm. = Staph.
Glycerin	10.0		
Borax	1.0		Findings here reveal bacteriostatic action only
Water	67.6		
B-II			
Phenol	2%	6-9 mm. zone	1-2 mm. = Staph.
Base	98%		3-4 mm. = Staph.
Stearic acid	18.4		5 mm. = Staph.
*(3) Triethanolamine	1.38	5 mm. zone	
Glycerin	10.0		Findings here reveal bacteriostatic action only
Borax	2.0		
Water	66.2		

*(1) Brand of glycerin monostearate manufactured by Fries Brothers, 92 Reade Street, New York City, under name of "xerol".

*(2) Brand of glycerin monostearate combination manufactured by The Goldschmidt Corporation, 70 Pine Street, New York City, under name of "Texacid".

*(3) Manufactured by Carbon and Carbide Co., New York City.

Most of the ointment bases employed, formulas of which are given in Table A, revealed distinct zones in the Agar Plate Test after the bactericidal agent was incorporated. Five of the eight bases revealed bactericidal action and the other three displayed a bacteriostatic action only. In all instances however the zones were distinct and not merely shaded areas adjacent to the ointment simulating the appearance of a zone, as observed when petrolatum or petrolatum and lanolin were employed as the bases (see paper by authors on 2 per cent. phenol ointments in this issue). Even considering the various physical factors (mentioned in the paper quoted), there would be no question when duplicating the same tests with these bases by different workers resulting in interpreting with ease these findings within narrow limits.

One may question the adaptability of the Agar Plate Test for testing the antiseptic efficiency of ointments as paralleling conditions met in practice when the ointment is applied to human tissue. But

until a more satisfactory test is presented, the Agar Plate Test is to be accepted as best adapted for a gross indication of the antiseptic possibilities of an ointment. When the same bactericidal agent is used in all instances but in combination with different bases and the same technique in testing is employed each time by the same worker under the same conditions and results are obtained repeatedly which reveal (under these conditions of testing) a more favorable finding in the case of the ointments possessing a vanishing cream (water miscible) base as compared with an unfavorable or indifferent finding or one difficult to interpret accurately as is found under identical conditions with a petrolatum or petrolatum and lanolin base, one cannot help (after observing the findings) to favor the former base.

The antiseptic efficiency testing was duplicated employing bichloride of mercury, a bactericidal agent more soluble in water than phenol. Four ointments containing 0.1 per cent. $HgCl_2$ in different bases and 0.1 per cent. $HgCl_2$ in an agar base were prepared and tested in the same manner as the phenol ointments, that is, the official Agar Plate Method as given on page 12 of Circular 198, United States Food and Drug Administration Methods of Testing Antiseptics and Disinfectants. It will be noted that clear distinct zones were obtained in all cases and that subcultures made from the agar within these zones showed no growth in all instances, proving that the organisms were killed by the $HgCl_2$ and not merely inhibited. However larger and more pronounced zones were obtained with the ointments in which a vanishing cream formula was the base. (See Table B.)

Remarks and Conclusions

The findings as observed herein and when testing other bases in which 2 per cent. phenol was incorporated reveal that water miscible bases are to be preferred as bases for bactericidal agents when incorporated in the latter to produce ointments, lotions, etc. Self-emulsifying wax and water miscible vanishing cream bases formulas of which are given were employed. These being miscible can be diluted with water and are comparable to conditions as found in practice on human tissue. Their use results in an "oil in water system," the oil being surrounded by the water which is free for circulation and for miscibility with the culture medium or tissues. In such a system electrical conductivity is possible. With petrolatum or similar bases, dilution is only possible with oil and not water as such bases are not miscible with the latter. They operate in a "water in oil system,"

TABLE B

BACTERICIDAL EFFICIENCY OF BICHLORIDE OF MERCURY OINTMENTS

Preparation	ZONE Number of Tests indicated in each case with 1.25 gm. of preparation	SUB-CULTURES Distance from ointment in millimeters
0.1% $HgCl_2$	7-10 mm. clear zone	1 mm. = no growth
12% glycerin monostearate	6 mm. clear zone	3 mm. = no growth
10% carbitol (ethylene glycol)		6 mm. = no growth
Water q. s. 100 cc.	6-7 mm. clear zone	5 mm. = no growth
0.1% $HgCl_2$		
12% tegacid (Goldschmidt)	11 mm. clear zone	1 mm. = no growth
		4 mm. = no growth
12% glycerin	8-9 mm. clear zone	8 mm. = no growth
Water q. s. 100 cc.	8-9 mm. clear zone	6-7 mm. = no growth
0.1% $HgCl_2$		
30% Protegin (oxycholesterin base)	7-14 mm. clear zone	1 mm. = no growth
		4 mm. = no growth
Lanolin 3%		10 mm. = no growth
Mineral Oil 5%	4-6 mm. clear zone	
Glycerin 5%		
Water 57%	3-5 mm. clear zone	5 mm. = no growth
0.1% $HgCl_2$		
Base 99.9%	7 mm. clear zone	1-3 mm. = no growth
Anhyd. lanolin 25%		4 mm. = no growth
Petrolatum 75%	7 mm. clear zone	4-6 mm. = no growth
		2 mm. = no growth
	6 mm. clear zone	4 mm. = no growth
	5-6 mm. clear zone	6 mm. = no growth
		3-4 mm. = no growth
0.1% $HgCl_2$	3-6 mm. clear zone	
in agar base	6 mm. clear zone	4-5 mm. = no growth

the water being surrounded by the oil and it is therefore not free to circulate with the aqueous fluid in the culture medium or tissues. In the latter system there is no electrical conductivity. It is possible to add glycerin or even sufficient fat so as to overcome the drying effect of these bases (if this characteristic is displayed), an objection which may be raised though many vanishing cream bases do not reveal such an effect.

We recommend these water miscible vanishing cream formulas as bases for bactericidal agents. We recommend that the U. S. P. or N. F. arrange to include such a formula in their next revision and we further recommended that the pharmacopœial revision committee arrange for a thorough study of these water soluble ointment bases as they appear to be more satisfactory vehicles for bactericidal agents than other ointment bases.

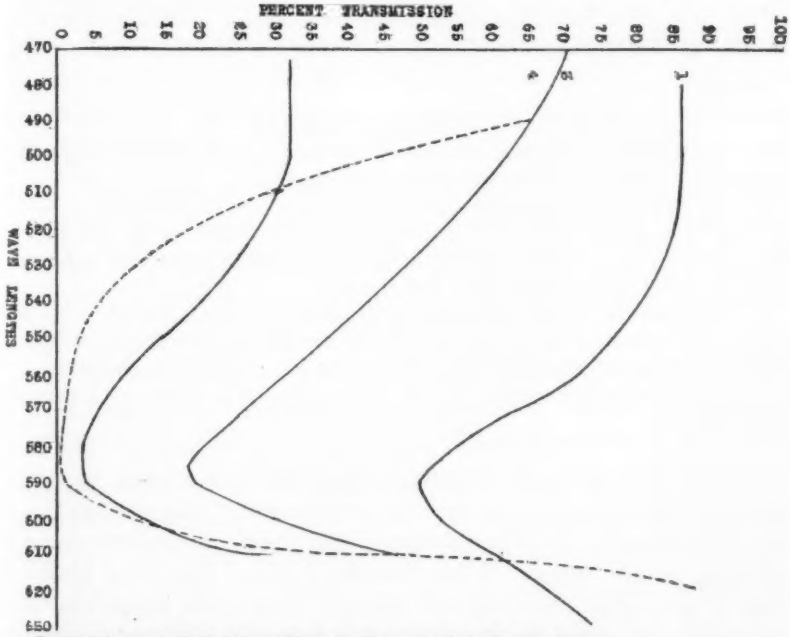
THE ABSORPTION SPECTRUM OF TETIOTHALEIN SODIUM

By Ellery H. Harvey

AMONG the dyes found useful in the practice of medicine is the sodium salt of the dibasic dye, tetraiodophenolphthalein, containing not less than 53 per cent. iodine and occurring as an odorless, blue crystalline powder. Following intravenous injection or oral administration it appears in the gall bladder to cast a shadow when the latter is exposed to the X-ray.

Another dye of value for the same purpose is the sodium salt of phenoltetraiodophthalein, existing as an odorless purple powder with a bronze cast.

In a short study of these substances absorption spectra were determined under several different conditions. These data are reproduced as curves, an inspection of which is helpful in identification and in the determination of purity and concentration.



Curve 0.1 gm. tetiothalein sodium in 50 cc. alcohol; 10 mm. layer.
Curve 2—0.05 gm. tetiothalein sodium in 50 cc. alcohol; 100 mm. layer.
Curve 3—0.01 gm. phentetiothalein sodium in 50 cc. alcohol; 5 mm. layer.
Curve 4—0.01 gm. phentetiothalein sodium in 50 cc. alcohol made slightly alkaline; 5 mm. layer.

It is noted that while the curves of the two salts are rather similar in slope, and the heads of the absorption band are at 585-590 *mμ*, tetiothalein sodium is not as sensitive to the addition of small amounts of n/10 acid and alkali as phentetiothalein. The latter salt, under the conditions named, is decolorized by acid and takes on a deeper red color with alkali.

ADVERTISING BEGINS TO CLEAN HOUSE—Announcement is made in a recent issue of *Printers' Ink* of the establishment, within the advertising industry itself, of a permanent review committee, which is to operate as a court of appeals. The committee is an outgrowth of a movement begun in May, 1932, to develop a code to control advertising practices in order to prevent a continuing trend toward the discrediting of all advertising. The plans of the permanent committee, which is at this time headed by Ralph Starr Butler, representing the Association of National Advertisers, and himself advertising manager for General Foods Corporation, involve the development of a code and of methods for handling violations of the code. Already the code drawn up includes seven points that tend to discredit advertising. These are:

1. False statements or misleading exaggerations.
2. Indirect misrepresentation of a product or service through distortion of details, either editorially or pictorially.
3. Statements or suggestions offensive to public decency.
4. Statements which tend to undermine an industry by attributing to its products, generally, faults and weaknesses true only of a few.
5. Price claims that are misleading.
6. Pseudoscientific advertising, including claims insufficiently supported by accepted authority or that distort the true meaning or application of a statement made by professional or scientific authority.
7. Testimonials which do not reflect the real choice of a competent witness.

It is interesting to find that advertising has at last begun to realize the menace inherent in many current advertising practices, and that it is doing the best thing possible under the circumstances; namely, cleaning its own house. It has been the pride of organized medicine that it invariably cleans its own house. It is to be hoped that this movement in the field of advertising, begun under such excellent auspices, will lead to much needed reforms.—(*J. A. M. A.*, Feb., 1933, p. 579.)

MEDICAL AND PHARMACEUTICAL NOTES

TOXICITY OF ALUMINIUM*—At the present time there appears to be a wholesome fear in the minds of the public that they are taking their lives in their hands when they use aluminium utensils for cooking. It would be highly instructive to know the true history of how this scare came about; but there are certainly a few medical men whose mission in life appears to be to preach the dangers of this metal. We are all agreed that the use of aluminium in baking-powder, now fortunately rare, is to be deprecated, especially as more efficient and quite harmless substitutes are available.

The Society of Public Analysts were fortunate a few months ago in having a valuable paper on this subject by Dr. Burn, which was followed by a full discussion, when many authoritative views were expressed. Dr. Burn has shown in his paper that exhaustive feeding experiments have been made with aluminium, both on men and animals. The effects of injection, as well as administration by mouth have been described by him. He has shown clearly that growth and reproduction are unaffected by this metal, and that the toxicity of aluminium is negligible in amounts likely to be present in foodstuffs as the result of using aluminium vessels.

There have been many letters written by doctors to medical journals suggesting that gastritis, gastric ulcers and possibly cancer may be caused by aluminium. These have shown that patients that were suffering from indigestion when aluminium was being used in their households became quite free from this trouble when the use was given up. Evidence of this type, of course, is worthless, for apart from the psychological factor, one of the most dangerous lines of thought in medical science is the association of cause and effect, unless all other factors can be absolutely controlled, and this is prac-

*American spelling: Aluminum.

tically impossible in medicine. Only a few years ago a substance—Alocol—was widely advocated for dyspepsia. Alocol is an aluminium salt.

One of these aluminium "enthusiasts," if I may call him so, found 300 gr. of aluminium per gallon in a stew that was made in an aluminium vessel. That means that with an aluminium pan weighing three ounces, you would require a new pan after making twenty stews.

The moment the aluminium salts reach the small intestine they are converted into insoluble carbonate, are not absorbed, and therefore do no harm. When injected, aluminium is far less toxic than manganese. Briefly, the explanation I have given concerning manganese and its failure to be absorbed applies equally to aluminium. I mention this subject as being of importance at the moment, and to show what varied aspects of my subject appear in modern life.—(*Phar. Jour.*, Feb. 11, 1933, p. 113.)

Multifarious Licorice—In ancient days, when sweets were reached for but not always obtained, any source of sweetness was interesting. The licorice shrub growing around the Mediterranean basin, and in China, attracted attention thousands of years ago, and a sizable literature has grown up in which are sung the praises of this remarkable confection and medicine. In the oldest Sanskrit and Egyptian are references to its general therapeutic excellence. In medicine, the use of licorice has tended more and more to become one of covering the taste of unpleasant concoctions. It is still used, however, for cough medicine and for a gentle laxative.

Large-scale utilization of licorice root, and its extract, took place in America principally in connection with the tobacco industry, and over one hundred tons of root are now treated daily. The greatest proportion goes into chewing tobacco, but some goes into cigarettes, cigars, snuff and pipe tobacco. A moderate amount also goes into licorice candy, but some so-called licorice is merely sugar candy colored by charcoal and flavored with anise. The "shoe-strings," "steam-

boat whistles" and black sticks were and are based on real licorice, and what taste-memories they bring back!

The extracted root is now largely used for making insulating wall board, which has exceptional mechanical strength. A "secondary" extract made by cooking the water-extracted root with alkali is the basis of the persistent foam used in smothering oil fires and for general fire-fighting.

Licorice bids for your consideration for modern and future usage. Licorice "extract" is freely soluble in water; it is extremely sweet, but there is also bitterness in present commercial extracts. It stabilizes foams, though it is not so active as the fire-extinguishing foams in this respect. It is dark in color, but possibly the color is not inseparable from the taste. A resin of the solubility behavior of shellac or "red gum" can be recovered in quantity from "spent root," if a good use for it can be found. Licorice is quite willing to stop talking of its great past and to adapt itself to modern conditions and times.—*Indust. Bulletin,* Arthur D. Little, Inc.

Smoking Found to Increase Carbon Monoxide in Blood—Tobacco smoking increases the amount of carbon monoxide in the blood of persons living under normal conditions and not exposed to obviously large amounts of the deadly gas, Dr. Alexander O. Gettler and Marjorie R. Mattice of Bellevue and Allied Hospitals and New York Post-Graduate Medical School of Columbia University, have found.

In their report to the American Medical Association they point out that the ideal normal person should have no carbon monoxide in his blood. But the average person under ordinary conditions is exposed so frequently to the colorless killer from automobile exhausts and other places that it is not possible to regard him as being entirely carbon monoxide free, although ordinary tests for toxic amounts of the gas might not show any in his blood.

Dr. Gettler and Miss Mattice consequently used a very delicate test for extremely small amounts of carbon monoxide in blood. The blood is tested because this gas combines with blood hemoglobin, preventing the latter from playing its role of oxygen carrier, with generally fatal results. They tested the blood of persons living in New York City but exposed to minimal amounts of the gas; persons living in the country; and persons who might be exposed to the gas in the course of their work, such as street cleaners and taxi drivers.

As might be expected, the average for the carbon monoxide percentage in the blood was highest for taxi drivers, next highest for street cleaners and lowest for persons living under ideal rural conditions. But even these persons had some of the gas in their blood.

The surprising fact was that tobacco smoking was apparently the most conspicuous factor in determining how much of the blood hemoglobin combined with the gas. The amount to which the individual was exposed seemed secondary.

One of the street cleaners, for example, worked on a street with an elevated railway over it, and fairly dense traffic composed largely of trucks, which produce more carbon monoxide than pleasure cars. He came to the laboratory after work, in his working clothes, having walked only one block from work. But of all the group he had the smallest amount of carbon monoxide in his blood. He does not smoke. In contrast, one of the cleaners who stopped in the morning on his way to work had more than the average for the group. But he had smoked six cigarettes on his way.—*Science News.*

BOOK REVIEWS

PURCHASING POLICIES AND PRACTICES OF CHAIN DRUG COMPANIES; by Ernest F. Witte, *University of Chicago Press,* 1933, 95 pages.

The factual data for this monograph was secured by an observation of the purchasing practices of four chain drug companies in Chicago, Louis K. Liggett Company, Owl Drug Company, Buck & Rayner, Inc., and the Walgreen Company. The first three of these organizations are now subsidiaries of Drug, Incorporated.

The monograph is weakened, in my judgment, because the author draws numerous general conclusions without adequate supporting data from his observations in Chicago. There are also annoying errors of fact in the monograph. These naturally cast doubt upon the care and accuracy with which other facts in the monograph were reported.

For instance, the footnote on page 24 about the McKesson and Robbins merger is quoted from *Drug Trade News* for August 18, 1929 (three and one-half years before the publication of the monograph). At the present time, McKesson and Robbins, Inc., operates about sixty wholesale drug houses, instead of the fifteen which it operated at the time of the publication quoted. Incidentally the firm style McKesson and Robbins, Inc., is incorrectly reported. Repeatedly the firm style of Louis K. Liggett Company is also incorrectly recorded.

On page 31, the brief explanation of the agency plans used by the Owl Drug Company and the United Drug Company seems to me to be wholly inadequate. The paragraph on pages 38 and 39 on syndicate buying by chain stores is incomplete and apt to be misleading.

On page 42, the author falls into the serious error of assuming that the individual retailer sells customarily at higher prices than the chain store because the combined total of the average gross margins of individually owned wholesalers and of individually owned retailers is greater than the average gross margins of chain stores. The fallacy in this assumption is twofold. Chain organizations do not make all of their purchases directly from manufacturers, nor do individual retailers make all of their purchases from wholesalers.

The author offers no convincing facts to substantiate his statement on page 50 that, "The expense of continuous selling to wholesalers is likely to be greater (than to chain stores)."

With two of the largest drug chains in bankruptcy and others in financial difficulties, the following statement on page 50 is grim irony to many chain store creditors: "It is an invariable rule with drug chains to take all cash discounts, and finances are maintained so that this can be done." The reader should remember that this monograph bears a 1933 date line!

The author's statements about wholesale trade discounts in the paragraph following on page 50 are similarly loose and incomplete.

The discussion on pages 66 to 68 of the efforts reported by the author to be made by chain drug store companies to sell competing products when Listerine and Bayer's Aspirin are asked for is not supported by any factual data which permits a critical analysis of the author's conclusions.

The total volume of sales reported by all drug stores in the United States to the United States Bureau of the Census for the census year 1929 was $1,684,000,000. Of these sales 81.5 per cent. were made by individually owned drug stores. The total number of drug stores in the United States was reported by the Bureau of the Census to be 57,716, of which 93.9 per cent. were found to be individually owned. The author could have strengthened greatly the scientific merit of his work had he stated these facts instead of his unsupported statement on page 73, "After all, the independent still sells approximately 80 per cent. of the merchandise sold by all drug stores, and operates from 90 to 95 per cent. of the total number of retail drug stores."

Again, on page 83, the author draws an unwarranted conclusion which quickly would have been disproved had his observations been more extensive. This conclusion which justifiably will cause apoplectic rage among the friends of professional pharmacy is that, "the drug business is a cut-rate business." There are two fundamental errors in this conclusion. Odd penny prices are not, necessarily, cut prices. A check of the inventories of a representative number of drug stores of different types will show that on much less than a majority of the items stocked is there such keen price competition as to result in "cut-rate" selling at retail.

Had the author of this monograph confined his observations to facts revealed by his studies of the purchasing methods of the four chain drug companies he observed and limited his conclusions to those permitted by these facts, the monograph would have been an interesting contribution of far greater scientific value than it now possesses.

Paul C. Olsen.

GARDENING WITH HERBS FOR FLAVOR AND FRAGRANCE. By Helen Morgenthau Fox. Drawings by Louise Mansfield. 334 pp. The Macmillan Company, 1933.

A woman has written this book, and has written it in a woman's way. It is chatty, enthusiastic, highly informative, and contains much about herbs that is new or which has been forgotten. The book is entirely different from the ordinary herbal or "the home doctor" book. It is written for the home gardener and the housewife. But it contains much that the drug store man will find useful.

The author started out gathering herb seeds, roots and slips from various parts of the globe and planting them. She finally rejected all of these which were primarily medicinal, and selected for flavor and fragrance.

She cultivated the plants with her own hands. The cultivation was largely keeping them clear of weeds, straggling growths, and selecting shady or sunny spots, as might be needed. She succeeded in producing an attractive, showy flower garden, but containing only herbs.

The plants were studied as they grew—from the time the seed was put in the soil, through the life stages, the development of leaf, branch, flower and fruit, until the seed came again. Every phase was noted. Specimen branches were pressed and submitted to botanical friends for verification. Color, taste and odor were carefully recorded with both the green and the dried plants.

All this is put down briefly and concisely in the book.

The woman, like the author, moved her kitchen into the garden, enlisted the aid of a French cook, and began to use her herbs in the culinary and perfumer's art. She made soups; sauces; egg, meat and fish dishes; salads; desserts; puddings; jellies; jams; cakes; cookies; cheeses carrying new flavors, odors and colors. She concocted innumerable drinks—cocktails, wines, meads, beers and teas.

This phase alone of the book should be studied by every druggist who has a soda or lunch department. Herein he can probably find new and attractive beverages never before concocted.

In addition, the book goes into perfumes, creams, sachets, powders and toilet mixtures. And incidentally, the author used her herbs in the making of the centuries' old "Galen's Cold Cream" and pronounced it "the best I have ever used."

When the author was not growing herbs she was searching the herbals, the books in libraries and everywhere, for data, old or new, in

regard to her herbs. The plants are accurately but briefly described. Their history and legend are noted. Their uses, especially for cooking and odor purposes, are detailed. Instructions are given for the culture and harvesting of the herbs.

The illustrations in black and white are not intended to be botanical delineations. They are evidently the artist's conception of the herbs as she sat under a sun umbrella in the herb garden.

Overlooking the sometimes womanly over-enthusiasm of the author, we may say that the book is well worth reading and owning. The author's example of making an herb garden is worthy of being followed.

Fred B. Kilmer.